Supreme Court, U.S.
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IN THE
SUPREME COURT OF THE UNITED STATES

October Term, 1979
No. 79-408

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, AND THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE

Petitioners,

v.

PEOPLE OF THE STATE OF ILLINOIS AND PEOPLE OF THE STATE OF MICHIGAN,

Respondents.

Appendices to the Petition for a Writ of Certiorari To the United States Court of Appeals For the Seventh Circuit

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Appendices to Petition for Writ of Certiorari
To the United States Court of Appeals
For the Seventh Circuit

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In the

United States Court of Appeals

For the Seventh Circuit

No. 77-2246

PEOPLE OF THE STATE OF ILLINOIS,

Plaintiff-Appellee,

and

PEOPLE OF THE STATE OF MICHIGAN,

Intervening Plaintiff-Appellee,

v.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,

Defendant-Appellants.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.
No. 72-C-1253—**John F. Grady**, *Judge.*

ARGUED MAY 24, 1978—SUBMITTED AFTER SUPPLEMENTAL BRIEFING OCTOBER 12, 1978—DECIDED APRIL 26, 1979

Before FAIRCHILD, *Chief Judge,* TONE, *Circuit Judge,* and HARPER, *Senior District Judge.**

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* The Honorable Roy W. Harper, Senior District Judge of the United States District Court for the Eastern and Western Districts of Missouri, is sitting by designation.

TONE, *Circuit Judge.* The State of Illinois filed this action under the federal common law of nuisance to enjoin the City of Milwaukee and the Sewerage Commissions of the City and County of Milwaukee[1] from discharging raw sewage and inadequately treated sewage into Lake Michigan.[2] Illinois alleged and undertook to prove at trial that the sewage contains pathogens, disease-causing viruses and bacteria, which are transported by currents into parts of the lake that lie within Illinois, where they present a substantial threat to the health of Illinois residents, and also that the sewage contains nutrients that accelerate eutrophication of the lake. The State of Michigan intervened as a plaintiff on the eutrophication issue only. After a four month trial, the district court found that plaintiffs had proved their allegations and entered a judgment requiring defendants to cease discharging raw sewage and to treat sewage before discharging it in compliance with effluent limitations more stringent than the minimum limitations imposed pursuant to the Federal Water Pollution Control Act, 33 U.S.C. § 1251, *et seq.* Defendants appeal, raising the issues of (1) whether the relief available in an action

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[1] For practical purposes, the two commissions may be regarded as one. *See also* n. 33, *infra.* The chief administrative officer for both is the same man; he also serves as the secretary for both commissions. The county commission has no employees other than the chief administrative officer and secretary referred to and uses the staff of the city commission when necessary. [Tr. 110-113.] In this opinion we differentiate between the two only when the difference is significant. [Record references in brackets are included in the slip opinion for the convenience of judges, counsel, and others who have access to the record but will be omitted from the opinion as it will appear in the Federal Second Reporter.]

[2] Illinois also named three other Wisconsin cities as defendants in this case: Kenosha, Racine, and South Milwaukee. They are not involved in this appeal.

After judgment was entered the County of Milwaukee moved to intervene as an indispensable party under Rule 19(b), Federal Rules of Civil Procedure (Fed. R. Civ. P.). The motion was denied; this court affirmed, without written opinion. The Supreme Court denied certiorari. 47 U.S.L.W. 3583 (1979).

based on the federal common law of nuisance is greater than that available under the federal statute, and (2) whether the evidence in this case is sufficient to support the relief granted. As to the first question, we hold that the statute does not limit the relief that may be granted; as to the second, we hold that the evidence is sufficient to support only some of the relief granted and therefore affirm in part and reverse in part.

This litigation began with Illinois' petition for leave to file an original action in the Supreme Court of the United States, which was denied, *Illinois v. Milwaukee*, 406 U.S. 91 (1972). Illinois then filed suit in the United States District Court for the Northern District of Illinois. Defendants' motions to dismiss for lack of *in personam* jurisdiction and improper venue were denied, *Illinois v. Milwaukee*, 4 E.R.C. 1849 (N.D. Ill. 1972); later, defendants' motions to dismiss for failure to state a claim on which relief could be granted were also denied, *Illinois v. Milwaukee*, 366 F.Supp. 298 (N.D. Ill. 1973).

In due course the case proceeded to trial, at the conclusion of which the judge orally and extemporaneously announced his findings of fact and conclusions of law. The facts and the relief granted will be described later, as they become pertinent to the issues discussed.

Defendant-appellants' position is supported by the briefs of three *amici curiae:* the State of Wisconsin, the National League of Cities, and the United States Conference of Mayors. In addition, the United States has filed a brief *amicus curiae* in which it takes no position on the merits but supports the arguments of Illinois and Michigan that the federal common law of nuisance is not preempted or limited by federal legislation.

After oral argument this court ordered supplemental briefing addressed to (1) the elements required to be proved to establish a claim for a common law nuisance, (2) identification of particularized findings of the district court considered material to those elements and record references to the evidence supporting those findings, and (3) identification of evidence in the record

supporting the reasonableness and necessity of the relief granted by the trial court. The parties filed extensive supplemental briefs, and each side subsequently filed a reply to the other's supplemental brief, as a consequence of which submission of the case was delayed until October 1978.

I.

Objections to the Forum

Defendants raise three arguments that may be broadly characterized as objections to the forum. First, defendants contend that they have committed no "tortious act within" the State of Illinois as that phrase is used in the Illinois "long-arm" statute, § 17 of the Illinois Civil Practice Act, Ill. Rev. Stat. ch. 110, § 17 (1977), and therefore service of process was ineffective and the United States District Court sitting in Illinois could not exercise personal jurisdiction over them. *See* Rule 4(e), Federal Rules of Civil Procedure (Fed. R. Civ. P.). Second, defendants contend that their contacts with Illinois are insufficient to meet the minimum required by *International Shoe v. Washington*, 326 U.S. 310 (1945). Third, defendants contend that even if the court had personal jurisdiction, venue was improper. Judge Bauer, then a district judge, rejected these contentions in denying defendants pretrial motions to dismiss in *Illinois v. Milwaukee*, *supra*, 4 E.R.C. at 1850, and we do likewise.

For purposes of § 17 "a tort is committed in the place where the injury occurs." *McBreen v. Beech Aircraft Corp.*, 543 F.2d 26, 28 (7th Cir. 1976). It seems beyond dispute that injury to the plaintiff in this case occurred in Illinois. *Cf. Ohio v. Wyandotte Chemicals Corp.*, 401 U.S. 493, 500 (1971).

As to the second contention, the critical issue is whether it is fair and reasonable to require the defendants to defend in Illinois. *See Kulko v. Superior Court of California*, 436 U.S. 84, 92 (1978); *Telco Leasing, Inc. v. Marshall County Hospital*, 586 F.2d 49 (7th Cir.

1978).[3] Each year defendants dump into Lake Michigan millions of gallons of pathogen-containing sewage, which the district court found is sometimes carried into Illinois waters and presents a substantial threat of harm to Illinois residents. Under such circumstances, we do not think it unfair or unreasonable to require the defendants to defend their conduct in a federal forum located within the State of Illinois. *See Ohio v. Wyandotte Chemicals Corp., supra,* 401 U.S. at 500.

Defendants argue that venue was improper for three different reasons: (1) the venue provision of the Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500, 86 Stat. 816, requires that the suit be filed in the district where the source is located, (2) all "nuisance" actions are "local" and therefore must be filed in the district where the source is located, and (3) all actions against a municipal corporation are "local" and therefore must be filed in the district where the municipal corporation is located. The first argument is quickly disposed of, for the venue provision of the statute is by its terms inapplicable. That provision is relevant only to "action[s] respecting a violation . . . of an effluent standard or limitation . . . brought under [§ 505] . . . ." § 505(c)(1). Here, plaintiff's action is based on the federal common law of nuisance. Therefore the relevant venue provision is 28 U.S.C. § 1391(b), which permits suit in either the "judicial district where all defendants reside, or in which the claim arose . . . ." *Illinois v. Milwaukee, supra,* 406 U.S. at 108 n.10.

Whatever may be the significance of state law in determining whether an action is "transitory" or "local" in

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[3] If Congress had chosen to authorize nationwide sevice of process, no minimum contacts issue would be raised. *See, e.g., Fitzsimmons v. Barton,* 589 F.2d 330, 333 (7th Cir. 1979); *Mariash v. Morill,* 496 F.2d 1138, 1143 & n. 6 (2d Cir. 1974). Congress has not done so and Fed. R. Civ. P. 4(e) makes jurisdiction dependent on the long-arm statute or rule of court of the state in which the district court is held; therefore we are required to determine whether defendants' contacts with Illinois are sufficient to support the exercise of *in personam* jurisdiction.

other contexts,[4] we agree with the district court, *Illinois v. Milwaukee, supra*, 4 E.R.C. at 1850, that the language in the Supreme Court's opinion in *Illinois v. Milwaukee, supra*, 406 U.S. at 108 n.10, indicates that an action against a municipal corporation and based on the federal common law of nuisance may be filed, pursuant to 28 U.S.C. § 1391(b), in either the district where all the defendants reside or the district where the claim arose, without regard to any otherwise applicable state venue statutes or common law rules. In this case, the claim arose in the Northern District of Illinois, where the injury was suffered, and therefore venue was proper.[5]

II.

Effect of Federal Statutes on Federal Common Law of Nuisance

In *Illinois v. Milwaukee, supra*, 406 U.S. 91, the Court denied Illinois' petition for leave to file an original action under 28 U.S.C. § 1251(a)(1),[6] on the ground that

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[4] *See, e.g., French v. Clinchfield Coal Company*, 407 F.Supp. 13, 16-17 n. 11 (D.Del. 1976) (Caleb Wright, J.); *Hasburgh v. Executive Aircraft Company*, 35 F.R.D. 354, 355 (W.D.Mo. 1964); *see generally* 1 *Moore's Federal Practice* § 0.142 [2.—1]; 1368-1369 & nn. 40-41 (1978); Wright, *Law of Federal Courts* 158 (2d ed. 1970); Wright, Miller & Cooper, 15 *Federal Practice and Procedure* § 3822 (1976).

[5] There is some debate as to whether there ought to be a uniform rule of law in federal courts governing the question of whether an action is "local" or "transitory." *See, e.g., French v. Clinchfield, supra*, 407 F.Supp. at 16-17 n. 11; Wright, Miller & Cooper, *supra*, § 3822 at 129-130; 1 *Moore's Federal Practice, supra*, at 1368-1369 & n. 40. *Illinois v. Milwaukee, supra*, 406 U.S. 108 n. 10, can also be understood as resolving this debate in favor of a uniform federal rule, at least in federal common law nuisance actions, and as indicating that such actions should be treated as "transitory." Under either interpretation of the language, § 1391(b) is applicable and venue was proper.

[6] That provision states,

> The Supreme Court shall have original and exclusive jurisdiction of: (1) All controversies between two or more States; . . . .

"States," as used in that provision, does not include political subdivisions. *Id.* at 98. The Court also declined to exercise its jurisdiction under 28 U.S.C. § 1251(b)(3),[7] since the issues raised in the complaint were governed by federal common law, and therefore an appropriate district court would have jurisdiction of the case under 28 U.S.C. § 1331(a).[8] After reviewing the provisions of the Federal Water Pollution Control Act, 62 Stat. 1155,[9] and other federal legislation regulating pollution of interstate waters, the Court held that federal common law had not been preempted, but noted "that new federal laws and new federal regulations may in time preempt the field of federal common law of nuisance." *Id.* at 107. Shortly after that decision Congress adopted the comprehensive Federal Water Pollution Control Act Amendments of 1972, P.L. 92-500, 86 Stat. 816. In 1977 Congress further amended the Act. P.L. 95-217, 91 Stat. 1566. Defendants concede that neither the 1972 nor the 1977 amendments preempt the federal common law of nuisance. Wisconsin's brief *amicus curiae*, however, argues that the comprehensive statutory scheme preempts the common law. The brief of the United States as *amicus curiae* argues to the contrary. Since the issue concerns our jurisdiction, we are obliged to consider it. *See, e.g., American Meat Institute v. EPA*, 526 F.2d 442, 448-449 (7th Cir. 1975). In addition, we consider whether the statute, even if it does not preempt the federal common law, limits the relief that may appropriately be granted or otherwise influences the principles to be applied in this action.

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[7] That provision states,
> The Supreme Court shall have original but not exclusive jurisdiction of: . . . (3) All actions . . . by a State against the citizens of another State . . . .

[8] That provision states,
> The district courts shall have original jurisdiction of all civil actions wherein the matter in controversy . . . arises under the . . . laws . . . of the United States . . . .

[9] For the provisions of the statute as amended at the time of the Court's decision *see* 33 U.S.C. § 1151 *et seq.* (1970).

A. *Federal Water Pollution Control Act*

1. *The Statute Before 1972*

The pre-1972 Federal Water Pollution Control Act, 62 Stat. 1155, as amended, 33 U.S.C. 1151, *et seq.* (1970), authorized each state, with the approval of the Secretary of the Interior, to adopt "water quality criteria applicable to interstate waters or portions thereof within" the state, 33 U.S.C. § 1160(c)(1) (1970), for the purposes of protecting the public health or welfare and enhancing the quality of water, *see* 33 U.S.C. § 1160(c)(3) (1970). If any state failed to adopt acceptable water quality criteria, the Act authorized the Secretary of the Interior to prescribe them, 33 U.S.C. § 1160(c)(2) (1970); water quality standards prescribed by the Secretary were subject to modification after review by a "Hearing Board" on petition of the governor of any state affected by the standards, 33 U.S.C. § 1160(c)(4) (1970). The Act also provided enforcement procedures, recently described by the Supreme Court as "cumbrous." *EPA v. California ex rel. State Water Resources Control Board*, 426 U.S. 200, 202 (1976); *see also Illinois v. Milwaukee*, *supra*, 406 U.S. at 103 (describing the enforcement procedures as "long" and "drawn-out").

The procedures for abating pollution originating in one state but allegedly causing harm in a second state are of primary importance for our purposes. The Act provided that upon complaint of the governor or water pollution control agency of the second state, the Secretary should call a conference, giving all the interested parties notice of, and an opportunity to make statements at, the conference. 33 U.S.C. § 1160(d)(1), (3) (1970). After the conference, the Secretary was directed to prepare a report for the benefit of the state agencies represented at the conference in which he summarized the proceedings and discussed, among other things, the adequacy of the measures taken to abate the pollution. 33 U.S.C. § 1160(d)(4) (1970). If the measures already taken were deemed inadequate, the Secretary was to recommend appropriate remedial action to the water pollution agency in the state from which the pollution

came. 33 U.S.C. § 1160(e) (1970). If after "at least six months" the state agency had not taken the necessary action, the Secretary was directed to conduct hearings at which all the interested parties would again be given an opportunity to make statements, this time before a "Hearing Board." 33 U.S.C. § 1160(f)(1) (1970). If the Hearing Board found that pollution endangering the public health or welfare was indeed occurring and that adequate steps toward abatement had not been taken, it submitted its findings and recommendations "concerning the measures, if any, which it [found] to be reasonable and equitable to secure abatement of such pollution." *Id.* The Secretary then forwarded the Hearing Board's findings and recommendations "together with a notice specifying a reasonable time (not less than six months) to secure abatement of such pollution" to the polluters and the originating state's water pollution control agency. *Id.* If the polluter or state agency failed to take "action reasonably calculated to secure abatement" within the specified time, then the Secretary was authorized to request the Attorney General to file suit to secure abatement. 33 U.S.C. § 1160(g)(1) (1970). Discharges that reduced the quality of water below any "water quality criteria" established under the Act were subject to abatement pursuant to similar procedures. 33 U.S.C. § 1160(c)(5) (1970) The Act made no provision for private abatement suits.

It is this system of interstate water pollution abatement, in combination with the discharge permit system administered by the Army Corps of Engineers, see note 16, *infra*, and other federal legislation, that the Court found insufficient to preempt the federal common law of interstate water pollution in *Illinois v. Milwaukee*, *supra*, 406 U.S. at 101-103, 107.

2. *The 1972 Act*

Because of the inadequacies inherent in the "water quality" approach and, among other things, the ineffectiveness of the enforcement procedures described

above,[10] Congress adopted the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. § 1251, *et seq.* The 1972 amendments, which we sometimes refer to herein as the Act or FWPCA, substantially rewrote the statute, supplementing the water quality criteria with direct discharge limitations and greatly strengthening enforcement procedures. Congress declared that the national goal was to eliminate the discharge of pollutants into navigable waters by 1985. To achieve that goal, Congress established general technology-based levels of treatment for any pollutant that is to be discharged into navigable waters and specified dates by which those levels of treatment are to be achieved, § 301;[11] all point sources[12] except publicly owned treatment works[13] must

[10] *See* S.Rep. No. 92-414, reprinted in [1972] *U.S. Code Cong. & Ad. News* 3668, 3671-3674 (1972); *see also* Note, "Federal Common Law in Interstate Water Pollution Disputes," 1973 *U. Ill. L. F.* 141, 143-144 & nn. 12-14.

[11] Sections of the 1972 Act (P.L. 92-500, 86 Stat. 816) are referred to in this opinion by their designations in the Statutes at Large. The parallel United States Code citations for the sections to which reference is made are as follows:

Section 101	—	33 U.S.C. § 1251
Section 201	—	33 U.S.C. § 1281
Section 212	—	33 U.S.C. § 1292
Section 301	—	33 U.S.C. § 1311
Section 304	—	33 U.S.C. § 1314
Section 309	—	33 U.S.C. § 1319
Section 402	—	33 U.S.C. § 1342
Section 502	—	33 U.S.C. § 1362
Section 505	—	33 U.S.C. § 1365
Section 510	—	33 U.S.C. § 1370
Section 511	—	33 U.S.C. § 1371

[12] "Point source" is defined as "any discernible, confined and discrete conveyance, . . . from which pollutants are or may be discharged." § 502(14).

[13] For purposes of "Title II—Grants for Construction of Treatment Works," treatment works are defined as "any devices and systems used in the storage, treatment, recycling, and reclamation of municipal sewage or industrial wastes of a liquid nature to implement section 201 of this Act [which is designed to encourage the development of the "best practicable waste treatment" over the life of the treatment work]

(Footnote continued on following page)

adopt the "best practicable control technology currently available" by July 1, 1977, and the "best available technology economically achievable" by July 1, 1983, §§ 301(b)(1)(A), (2)(A); publicly owned treatment works are required to adopt "secondary treatment" by July 1, 1977 and "the best practicable waste treatment over the life of the [treatment] works" by July 1, 1983, §§ 301(b)(1)(B), (2)(B), and 201(g)(2)(A). The Act directs the Administrator of the Environmental Protection Agency (EPA)[14] to prescribe the specific effluent limitations achievable using "best practicable" treatment technology, §§ 301(b)(1)(A), 304(b)(1), "best available" treatment technology, §§ 301(b)(2)(A), 304(b)(2), and "secondary" treatment technology, §§ 301(b)(1)(B), 304(d)(1). *See, e.g., E.I. du Pont de Nemours & Co. v. Train*, 430 U.S. 112, 126-136 (1977); *American Meat Institute v. EPA, supra*, 526 F.2d at 448-452. In addition, all point sources, presumably including publicly owned treatment works, must comply with "any more stringent limitation . . . established pursuant to any state law or regulations (under authority preserved by § 510)[15] or any other Federal law or regulations . . . ." § 301(b)(1)(C).

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[13] *continued*

. . . . [and] any other method or system for preventing, abating, reducing, storing, treating, separating, or disposing of municipal waste, including storm water runoff, or industrial waste, including waste in combined storm water and sanitary sewer systems." §§ 212(2)(A), (B). Although "treatment works" is not defined for purposes of "Title III—Standards and Enforcement," the definitions provided in § 212 provide an indication of what may have been intended. We recently noted that "[a]n earlier specific definition may properly color a subsequent use of the same words without redefinition," quoting from *Kent Mfg. Corp. v. Commissioner*, 288 F.2d 812, 815 (4th Cir. 1961). *Nachman Corp. v. Pension Benefit Guaranty Corp.*, ... F.2d ..... , ... n. 6 (7th Cir. 1979).

[14] "EPA" in this opinion includes the administrator and the agency.

[15] Section 510 provides,

> Except as expressly provided . . . nothing in this Act shall (1) preclude or deny the right of any State or

(Footnote continued on following page)

The 1972 Act also created a permit system, called the National Pollutant Discharge Elimination System (NPDES), under which discharge permits may be granted by EPA or, where a state provides satisfactory assurances that it will enforce the requirements of the Act and EPA regulations, a designated agency of the state.[16] Any discharges, except in compliance with the limitations imposed in a permit, are declared unlawful. § 301(a). A permit must require the discharger to meet the minimum effluent limitations prescribed in the Act and EPA regulations. § 402(b)(1)(A).

Each state agency established under the National Pollutant Discharge Elimination System is required to notify EPA of any permit to be issued under the program. § 402(d)(1). If, under the permit, the waters of another state "may be affected," the agency is required to notify the other state, to give the other state an opportunity to submit written recommendations concerning the limitations to be imposed in the permit, and, if those recommendations are not adopted, to explain why in writing to EPA and the other state. §§ 402(b)(3), (5).

EPA may veto the issuance of any discharge permit if the waters of a state other than the issuing state may be

[15] *continued*
political subdivision thereof or interstate agency to adopt or enforce (A) any standard or limitation respecting discharges of pollutants, or (B) any requirement respecting control or abatement of pollution; except that if an effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance is in effect under this Act, such State or political subdivision or interstate agency may not adopt or enforce any . . . less stringent . . . effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard or standard of performance . . . ; or (2) be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to waters . . . of such States.

[16] This system replaced the permit system formerly administered by the Army Corps of Engineers under the Act of 1899, 30 Stat. 1152, 33 U.S.C. § 407. *United States Steel Corp. v. Train*, 556 F.2d 822, 831 & n. 7 (7th Cir. 1977); *American Meat Institute v. EPA*, *supra*, 526 F.2d at 446.

suggests that use of the higher standard was a part of an accommodation devised to enable the Supreme Court, structured as it is "to perform as an appellate tribunal," *id.* at 498, to cope with original actions in that Court involving interstate disputes regarding air and water pollution.[29] He also indicated that the higher standard of proof might be appropriate in original actions against private defendants as well. *Id.* at 501 n.4. Justice Harlan's rationale for requiring the higher standard of proof is inapplicable when the action is tried in a trial court; and the alternative, sovereign state rationale recognized in the earlier cases is inapplicable here, *cf. Illinois v. Milwaukee*, *supra*, 406 U.S. at 98 (political subdivisions of a state are not "States" as used in 28 U.S.C. § 1251(a)(1), see note 6, *supra*). Accordingly, we think the correct standard of proof in this case is a preponderance of the evidence[30] rather than clear and convincing evidence, although we can say, as did the district court, that use of either standard would produce the same result.

IV.

Sufficiency of the Evidence Supporting Findings of Fact

The district court found that the defendants dump substantial quantities of pathogen-containing sewage into Lake Michigan each year, that the lake currents

[29] The complementary part of the accommodation was that the Court imposed on itself "the duty of applying only legal principles 'which [it] is prepared to maintain against all considerations on the other side. . . .'" *Id.* at 501.

[30] Although federal law governs, we note that some state courts have also adopted the preponderance standard in nuisance cases. *See, e.g., City of Northlake v. City of Elmhurst*, 41 Ill. App. 2d 190, 197, 190 N.E.2d 375, 379 (1963); *Iowa v. Miller*, 250 Ia. 1369, 1373, 98 N.W.2d 859, 860 (1959); *Findley Lake Property Owners v. Town of Mina*, 31 Misc.2d 356, 154 N.Y.S. 2d 775, 795 (N.Y.Sup.Ct. 1956); *Welborn v. Page*, 247 S.C. 554, 563, 148 S.E. 2d 375, 379 (1966); *see also Boller v. Texas Eastern Transmission*, 87 F.Supp. 603, 605 (E.D. Mo. 1949) (diversity case).

affected. §§ 402(d)(2)(A), (b)(5). It is not clear whether the veto can be based on a ground other than violation of a standard imposed pursuant to the Act by EPA or a state. The language of § 402(d)(2)(A) suggests that it can.[17] The legislative history, however, indicates that the veto must be based upon the issuing state's failure to impose limitations sufficient to assure that applicable effluent limitations, either those imposed under the Act by EPA or those imposed by the affected state, are respected.[18] Since there has been no veto here, it is unnecessary for us to resolve this ambiguity.

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[17] Section 402(d)(2) provides that,

> No permit shall issue (A) if the Administrator within ninety days of his notification under subsection (b)(5) of [402] objects in writing to the issuance of such permit, or (B) if the Administrator within ninety days of the date of transmittal of the proposed permit by the State objects in writing to the issuance of such permit as being outside the guidelines and requirements of this Act.

Comparison of §§ 402(d)(2)(A) and (B) suggest that, although vetoes must usually be based on a violation of the effluent limitations imposed under the Act, there is no such requirement where the interests of a second state are involved. *But cf.* § 505(h) (authorizing governor's suit against Administrator of EPA, but only for failure to enforce effluent limitations imposed under the Act against a point source in another state resulting in harm to waters in governor's state) quoted in note 19, *infra; see also* § 505(a) (citizens' suits to enforce limitations imposed under the Act).

[18] The Administrator's general veto authority is expressly limited to cases in which the minimum limitations imposed under the Act are violated. § 402(d)(2)(B). The Senate version of the Act, S. 2770, provided that no permit could be issued by any state agency "until the Administrator is satisfied that the conditions imposed by the State meet the requirements of this Act." S. 2770, 92d Cong., 1st Sess. § 402(d)(2) (1971), reprinted in 117 Cong. Rec. 38865, 38883 (1971); Library of Congress, *A Legislative History of the Water Pollution Control Act Amendments of 1972*, 1534, 1690 (1973). The House version of the Act, H.R. 11896, specifically rejected the permit-by-permit review approach S. 2770 and only authorized the Administrator to veto those permits under which the waters of a second state might be affected. H.R. 11896, 92d. Cong., 2d Sess. § 402(d)(2) (1972), reprinted in 118 Cong. Rec. 10804,

(Footnote continued on following page)

The 1972 Act also substantially modified enforcement procedures. "Whenever, on the basis of any information available to him, the Administrator finds that any person is in violation of any condition or limitation" imposed under the Act, including those contained in state-issued discharge permits, he may at his option "issue an order requiring such person to comply," commence a civil action for appropriate relief in a federal district court, or notify the appropriate state agency of the violation. §§ 309(a)(1), (3), (b). If the latter course is chosen and after 30 days the state agency has not taken appropriate action to secure compliance, the Administrator must exercise one of the first two options. § 309(a).

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[1] *continued*
10824 (1972); 1 *Legis. Hist., supra*, 893, 1058-1059. In part, the Act incorporates the provisions of both S. 2770 and H.R. 11896. *See* note 17, *supra*.

The House provision was intended as a state-permit analogue to the provisions of H.R. 11896, *supra*, § 401, which requires every applicant for a federal license to secure a statement from the appropriate state to the effect that no applicable effluent limitation will be violated by the activity for which the license is sought. *See* H.R. Rep. No. 92-911, 92d Cong. 2d Sess., reprinted in *Legis. Hist., supra*, 753, 808-814. Concerning H.R. 11896, § 402(d)(2), the House Committee explained:

> The committee has included this procedure to protect States which might otherwise be affected by the issuance of a permit in a second State. This is similar to the safeguards given to States in the certification procedure under section 401. However, since permits granted by States under section 402 are not Federal permits—but State permits—the certification procedures are not applicable.

Id. at 814. As noted above the House specifically rejected the permit-by-permit review approach of the Senate bill, in favor of giving the individual states "maximum responsibility for the permit program." *See id. See also* the discussion of the 1977 amendments to the veto provisions, *infra*.

For more detailed discussions of the legislative history of the veto provisions see *Save the Bay v. Administrator of the Environmental Protection Agency*, 556 F.2d 1282, 1284-1287 (5th Cir. 1977); *Mianus River Preservation Committee v. Administrator of EPA*, 541 F.2d 899, 906-909 (2d Cir. 1976).

Criminal and civil penalties are provided in §§ 309(c) and (d).

In accord with the stated policy of encouraging "[p]ublic participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established" under the Act, § 101(e), Congress authorized any "person . . . having an interest which is or may be affected" to file a civil action to secure compliance with the Act against any person alleged to be in violation of the provisions of the Act or against the Administrator if he fails to perform any nondiscretionary duty under the Act. §§ 505(a), (g).[19] But "[n]othing in [§ 505] shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief (including relief against the Administrator or a State agency)." § 505(e).

3. *The 1977 Amendments.*[20]

The 1977 amendments are fairly extensive, but of limited significance for our purposes. In them Congress modified the National Pollutant Discharge Elimination System to provide that when EPA objects to the issuance of a permit, it must also state "the reasons for such objection and the effluent limitations and conditions which such permit would include if it were issued by the Administrator." § 65(b), 91 Stat. 1599, as amended, 33 U.S.C.A. § 1342(d)(2). A procedure was provided to avoid the impasse that had been possible under the 1972

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[19] Also, the governor of a state may file a civil action against the Administrator "where there is alleged a failure of the Administrator to enforce an effluent standard or limitation under this Act the violation of which is occurring in another State and is causing an adverse effect on the public health or welfare in his State, or is causing a violation of any water quality requirement in his State." § 505(h).

[20] Clean Water Act of 1977, P.L. 95-217, 91 Stat. 1566 (to be codified 33 U.S.C. §§ 1251 *et seq.*).

Act when EPA objected to the issuance of a specific permit but the state agency refused to issue a modified permit; under the amendments, if EPA "objects to the issuance of a permit," the issuing state is entitled to a public hearing on the objection. § 65(a), 91 Stat. 1599, as amended, 33 U.S.C.A. § 1342(d)(4); *see* S.Rep.No. 95-370, 95th Cong., 1st Sess. 73, reprinted in [1977] *U.S. Code Cong. & Ad. News* 4326, 4398; H.R. Rep. No. 95-830, 95th Cong., 1st Sess. 96-97, reprinted in [1977] *U.S. Code Cong. & Ad. News* 4424, 4471-4472. If the state either fails to request a hearing within 90 days of the objection or fails to submit a revised permit meeting the objection, then EPA may issue a permit itself "in accordance with the guidelines and requirements" of the Act § 65(a), *supra.*

Congress also adopted provisions authorizing EPA, with the concurrence of the State in which the point source is located, under limited circumstances, to modify the dates by which the effluent levels established in the 1972 Act for all point sources must be met. *See* §§ 43, 44, 45, 91 Stat. 1583-1586, as amended, 33 U.S.C.A. §§ 1311(g), (h), (i). The provisions applicable to modification of compliance dates for publicly owned treatment works are of particular significance here. Where construction is necessary for compliance with the "secondary treatment" or "more stringent" requirements of the 1972 Act, §§ 301(b)(1)(B), (C), but cannot be completed in time to meet these requirements or "the United States has failed to make financial assistance . . . available in time to achieve such limitations . . . ," EPA or the appropriate state agency may extend the compliance date to July 1, 1983. § 45, 91 Stat. 1584-1585, as amended, 33 U.S.C.A. § 1311(i). The language and legislative history of this provision, however, make it clear that the maximum compliance possible at the time must be achieved throughout the period and complete compliance achieved at the "earliest date practically possible." *Id.;* S. Rep. No. 95-370, 95th Cong., 1st Sess. 47, reprinted in [1977] *U.S. Code Cong. & Ad. News* at 4372. The 1977 amendments also provide for pollutant-specific modifications of the requirements of the 1972 Act. § 44, 91 Stat. 1584, as amended, 33 U.S.C.A. § 1311(h). Upon

an adequate showing that, among other things, "there is an applicable water quality standard specific to the pollutant for which the modification is requested" and the modification would "not interfere with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection . . . of a balanced . . . population of shellfish, fish, and wildlife, and allows recreational activities, in or on the water . . . ," EPA, "with the concurrence of the State, may issue a permit . . . which modifies the secondary treatment effluent limitations prescribed under the Act for publicly owned treatment works." *Id.*

The only other provision of the 1977 amendments that is of significance for our purposes directs EPA to conduct a study and report to Congress on "the status of combined sewer overflows in municipal treatment works operations." § 70, 91 Stat. 1608, as amended, 33 U.S.C.A. § 1375(c). The Senate committee studying the proposed legislation noted that "the second largest category of municipal needs identified in the 1976 National needs list is the correction of combined sewer overflows . . . . Examples brought to the committee's attention showed combined sewer overflow problems to be a significant source of untreated sewage to the Nation's waters." S. Rep. No. 95-370, *supra*, 81, reprinted in [1977] *U.S. Code Cong. & Ad. News*, *supra*, 4406. One of the purposes of the report is to determine whether new legislation to address the problem is needed. § 70, 91 Stat. 1608, as amended, 33 U.S.C.A. § 1375(c).

B. *Preemption and Compliance with the Statute As a Defense*

Congress has thus established a comprehensive and detailed system for the regulation and eventual elimination of pollutant discharges into the nation's waters. Nevertheless, Congress has expressly stated that the effluent limitations imposed under the Act do not preclude the establishment of more stringent limitations by any state, § 510, *see United States Steel Corp. v. Train*, *supra*, 556 F.2d at 835-836, 837-838; and nothing in the Act is to be construed as "limiting the authority of any officer or agency of the United States under any

other law or regulation not inconsistent with [the] Act; . . . ." § 511(a). The language of § 511(a) is arguably broad enough to include the federal courts and, when read in the light of § 510, suggests, if it does not require, the conclusion that Congress did not intend to preempt the federal common law of nuisance. The imposition of effluent limitations more stringent than those required under the Act, if necessary to prevent harm to a complaining party, is fully consistent with the provisions of the Act. Because of the shared authority between the federal government and the individual states established in the Act, it is plain that uniformity was not thought necessary. Even the minimum effluent limitations prescribed in the Act are not uniform because the provisions for the ad hoc modification of the degree of compliance required for specific point sources will necessarily lead to variation.

While providing in § 505 for private suits to enforce the effluent limitations prescribed in the Act, Congress specifically stated that nothing in the section "shall restrict any right which any person . . . may have under any statute or common law to seek enforcement of any effluent standard or limitation or to seek any other relief . . . ," thus indicating that preemption of existing remedies was not intended. There is nothing in the phrase "any statute or common law" that suggests that this provision is limited to state common law. There is no reason to believe that Congress would have wished to preserve state common law claims and preclude federal common law claims. The preservation of all existing remedies is consistent with the recognition in this Act of the value of public participation in all aspects of the effort "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," exemplified by the direction to EPA and states participating in the national discharge permit system to encourage such participation. *See also Citizens for a Better Environment v. EPA*, ... F.2d ..... , ... (7th Cir. 1979). We conclude that the federal common law of nuisance has not been preempted by the Act.

For the same reasons, we reject defendants' contention that compliance with a discharge permit issued under the Act is a defense in an action based on the federal common law of nuisance. *Cf. New York v. New Jersey*, 256 U.S. 296, 308 (1921) (in which the Court noted a construction permit issued by the Secretary of War, presumably under the provisions of the Rivers and Harbors Act of 1899 that were replaced by § 402 of the 1972 Act, see note 16, *supra*, incorporating discharge limitations adopted in a settlement agreement with United States but did not regard the limitations as dispositive in New York's action against New Jersey); *Baltimore & Potomac R. Co. v. Fifth Baptist Church*, 108 U.S. 317 (1883) (rejecting the defendant railroad's arguments that compliance with District of Columbia smoke stack regulations, the existence of a federal charter authorizing defendants to "make and construct all works whatever which might be necessary and expedient," or congressional approval of the train route constituted a defense in a nuisance action when plaintiff suffered injury resulting from defendant's activity).[21] *But*

[21] The law of Wisconsin is in accord. *See, e.g., Winchell v. Waukesha*, 110 Wis. 101, 109, 85 N.W. 668, 670 (1901) ("The great weight of authority, American and English, supports the view that legislative authority to install a sewer system carries no implication of authority to create or maintain a nuisance. . . . If such nuisance be created, the same remedies may be invoked as if the perpetrator were an individual."); *Costas v. City of Fond du Lac*, 24 Wis. 2d 409, 415-416, 129 N.W.2d 217, 220-221 (1964) (operation of sewage plant in accord with state specifications, orders, and regulations is no defense in nuisance action). For other state cases to the same effect, *see, e.g., People of the State of California v. Los Angeles*, 160 Cal. App. 2d 494, 505-506, 325 P.2d 639, 645 (Ct. App. 1958); cases cited in Annotation, "Sewage Disposal Plant as Nuisance," 40 ALR 2d 1177, 1182-1186 (1955), Later Case Service, 40 ALR 2d 77, 77 (1969), Later Case Service Supp. 42, 42 (1978); cases cited in Annotation, "Right to, and Propriety of Injunction Against Nuisance for Discharge of City Sewage," 77 L.Ed. 1213, 1227-1231 (1933); cases cited in Davis, "Theories of Water Pollution Litigation," 1971 Wis. L. Rev. 738, 768 n. 138, 771 n. 148 (1971); *cf. Venuto v. Owens Corning Fiberglass*, 22 Cal. App. 3d 116, 128-129, 99 Cal. Rptr. 350, 358-359 (1971) (air pollution).

compare Pennsylvania v. Wheeling & Belmont Bridge Co., 13 How. (54 U.S.) 518 (1851) *with Pennsylvania v. Wheeling Bridge Co.*, 18 How. (59 U.S.) 421 (1856) *and Northern Transportation Co. v. Chicago*, 9 Otto (99 U.S.) 635 (1879).

C. *Limitations on Relief*

Defendants contend that even if the Act does not preempt the federal common law of nuisance, and even if compliance with the Act is not a defense, no more stringent relief can be granted by way of abatement than the federal minimum prescribed by the Act and EPA. In other words, although the federal government need not speak with a single voice, the words must be the same. As noted above, however, Congress has expressly stated that nothing in the Act should be read to limit the authority of any federal "officer or agency" so long as that authority is consistent with the provisions of the Act. Consistency does not require uniformity; the provision expressly preserving the authority of the states to impose limitations more stringent than those required under the Act, § 510, indicates that Congress did not think more stringent limitations inconsistent with the Act. Moreover, the savings clause, § 505(e), speaks not only of rights, but also of remedies. Since any effluent limitations less stringent than those provided in the Act, except pursuant to the modification procedures established, are prohibited, § 505(e) must contemplate more stringent limitations than those imposed in the Act. If accepted, defendants' argument would reduce a cause of action under the federal common law to no more than an alternative avenue for enforcement of the statute. For the reasons stated above, we do not think that Congress intended any such restriction or that the statute, fairly read, limits the relief available in a federal court.

D. *Common Law of the Statute*

The conclusion that the Federal Water Pollution Control Act, as amended, does not preempt the federal com-

mon law of nuisance or limit the relief available in this case does not render that Act irrelevant. A statute that does not by its terms govern the case before a court may contain indications of the legislature's judgment on relevant issues of policy or provide an appropriate principle for decision of the case.[22] In applying the federal common law of nuisance in a water pollution case, a court should not ignore the Act but should look to its policies and principles for guidance. *See Illinois v. Milwaukee, supra*, 406 U.S. at 103 n.5; *cf. Textile Workers v. Lincoln Mills*, 353 U.S. 448, 456-457 (1957).

The Act contains no rules or principles that control in this case. We think, however, that the minimum treatment standards found acceptable by Congress and the effluent limitations imposed under the system established in the Act provide an appropriate starting point. *Cf., e.g., Wallis v. Pan American Petroleum*, 384 U.S. 63, 69 (1966). In the 1972 Act, Congress said that by July 1, 1977, publicly owned treatment works must, with several significant exceptions, adopt "secondary" treatment. That command was qualified by the 1977 amendments authorizing EPA or the appropriate state agency to extend the time for compliance with the secondary treatment standard to July 1, 1983. The Act's generally more stringent second stage provisions only require "the application of the best practicable waste treatment technology *over the life of the works* . . . ," by July 1, 1983. §§ 301(b)(2)(B), 201(g)(2)(A) (emphasis added). Thus, Congress has approved secondary treatment

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[22] *See, e.g., Moragne v. States Marine Lines*, 398 U.S. 375, 390-393, 406-408 (1970); Landis, "Statutes and the Sources of Law," *Harvard Legal Essays* 213 (1934), reprinted in 2 *Harv. J. Legis.* 7, 12-19, 21-22 (1965); Page, "Statutes as Common Law Principles," 1944 *Wis. L. Rev.* 175, 186-211; Schaefer, "Precedent and Policy," 34 *U. Chi. L. Rev.* 3, 20-22 (1966); Stone, "The Common Law in the United States," 50 *Harv. L. Rev.* 4, 14-15 (1936); Traynor, "Statutes Revolving in Common-Law Orbits," 17 *Cath. U. L. Rev.* 401, 403-408, 412-417, 421-424 (1968).

as an acceptable minimum for publicly owned treatment works at least until 1983 and perhaps later.[23]

EPA has defined secondary treatment for the purposes of the Act in terms of resulting effluent quality. 40 C.F.R. § 133.102. Even though states are authorized to establish more stringent effluent limitations than those required by EPA, §§ 402, 510, there appear to be no Wisconsin regulations imposing more stringent standards, and the NPDES permits issued by the Wisconsin agency to the defendants in this case impose limitations no more stringent than those required by EPA.[24]

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[23] Comparison of the treatment levels demanded of publicly owned treatment works and those demanded of all other point sources suggests that Congress was of the view that publicly owned treatment works should be subject to less stringent standards than other point sources. Point sources other than publicly owned treatment works were required to implement the "best practicable control technology currently available," as determined by EPA, by July 1, 1977. § 301(b)(1)(A). Senator Muskie, the "principal author of the Act," *see American Meat Institute v. EPA*, *supra*, 526 F.2d at 451, expressed the view that although EPA had authority to define "best practicable" as "the equivalent of secondary treatment for industry," more stringent requirements might also be imposed, 1 *Legislative History of the Water Pollution Control Act Amendments of 1972* 167-170 (1973), quoted in *American Meat Institute v. EPA*, *supra*, 526 F.2d at 453. The 1972 Act required point sources other than publicly owned treatment works to implement "best available treatment" by 1983, § 301(b)(2)(A); the 1977 amendments modified this provision to require "best conventional treatment" for pollutants identified by EPA as "conventional" by July 1, 1984, and "best available treatment" for other pollutants, no later than July 1, 1987. § 42, 91 Stat. 1582-1583, as amended, 33 U.S.C.A. §§ 1311(b)(2)(A), (E), (F).

[24] EPA has not vetoed the permits issued by the Wisconsin agency. *See* notes 17 and 18, *supra*, and accompanying text. Before filing this action, Illinois invoked the enforcement procedures of the pre-1972 Act, *see*, Note, "Federal Common Law in Interstate Disputes," *supra*, 1973 *U. Ill. L. F.* at 144 & nn. 17-19, but apparently chose not to pursue the remedy provided in § 402(b)(5) and did not attempt to have EPA veto the permits issued to the defendants under § 402(d)(2)(A).

As we shall explain in more detail below, the effluent limitations contained in the permits are less stringent than those imposed by the district court in this case. In addition, the permits contain no prohibitions against discharges of raw sewage through overflows.

While it is appropriate to give weight to Congress' expectations in adopting the Act and the standards established by EPA pursuant to the Act, we cannot forget that Congress deliberately chose to preserve existing rights and remedies. Thus, if the evidence in this case shows that requirements more stringent than those imposed in the NPDES permits are necessary to protect Illinois residents from harm caused or threatened by the defendants' sewage discharges, plaintiffs are entitled to have the more stringent requirements imposed. We can think of no other reason for Congress' preserving previously existing rights and remedies than to protect the interests of those who would be able to show that the requirements imposed pursuant to the federal statute are inadequate to protect their interests. When the complaining party is a neighboring state, the federal common law of nuisance provides a peculiarly appropriate remedy.[25]

III.

Elements of the Claim, Relief, and Standard of Proof

The elements of a claim based on the federal common law of nuisance are simply that the defendant is carrying on an activity that is causing an injury or significant threat of injury to some cognizable interest of

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[25] Although the Administrator's power to veto permits that will result in harm to the waters of a second state provides some protection, as noted above, his authority may be limited to those cases in which the complaining state can point to some applicable effluent limitation or water quality standard that will be violated. Furthermore, the Administrator's power to waive review of permits issued to any category of point sources may render any protection that is provided by the veto provisions illusory. §§ 402(d)(3), (e), (f).

the complainant. *See Georgia v. Tennessee Copper*, 206 U.S. 230, 238-239 (1907).

It has been said that "in such a suit traditional limitations on equitable remedies are applicable." *United States v. Stoeco Homes*, 498 F.2d 597, 611 (3d Cir. 1974). This would mean that an injunction would be granted only when the right to relief is clear and the remedy at law inadequate. *Missouri v. Illinois*, 180 U.S. 208, 248 (1901); Wright & Miller, 11 *Federal Practice and Procedure*, § 2942, 364, 368-369 (1973); *see also Mugler v. Kansas*, 123 U.S. 623, 672-673 (1887).[26] But when a state complains of pollution originating outside its territory the rules are different:

> If the state has a case at all, it is somewhat more certainly entitled to specific relief than a private party might be . . . .
>
> It is a fair and reasonable demand on the part of a sovereign that the air over its territory should not be polluted . . . by the act of persons beyond its control . . . . If any such demand is to be enforced this must be, notwithstanding the hesitation that we might feel if the suit were between private parties, and the doubt whether, for the injuries which they might be suffering to their property they should not be left to an action at law.

Georgia v. Tennessee Copper, supra, 206 U.S. at 237-238. Moreover, when the polluting activity is shown to endanger the public health, injunctive relief is generally appropriate. *See Harrison v. Indiana Auto Shredders Co.*, 528 F.2d 1107, 1122-1123 (7th Cir. 1976) (diversity case applying Indiana law).

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[26] For state law cases to the same effect *see, e.g., Green v. Smith*, 231 Ark. 94, 96, 328 S.W.2d 357, 359 (1959); *Delaware Optometric Association v. Sherwood*, 35 Del. Ch. 507, 511, 122 A.2d 424, 427 (1956); *City of Pana v. Central Washed Coal Co.*, 260 Ill. 111, 122-123, 102 N.E. 992, 997 (1932); *City of Chicago v. Commonwealth Edison Company*, 24 Ill. App. 3d 624, 632, 321 N.E.2d 412, 418 (1974); *Harden Chevrolet v. Pickaway Grain Co.*, 27 Ohio Ops. 144, 147, 194 N.E.2d 177, 180 (Ct.C.Pl. Ohio 1961); *Wade v. Fuller*, 12 Utah 2d 299, 301, 365 P.2d 802, 804 (1961).

Similarly, while determining whether to issue an injunction generally involves a balancing of the interests of the parties,[27] Wright & Miller, *supra*, § 2942 at 366-367 & n.43, the balance is of less importance when the plaintiff is a sovereign state. *See Georgia v. Tennessee Copper*, *supra*, 206 U.S. at 238. And if the pollution endangers the public health, injunctive relief is proper, without resort to any balancing. *See Harrison v. Indiana Auto*, *supra*, 528 F.2d at 1122-1123.

In exercising its original jurisdiction in interstate pollution cases, the Supreme Court has applied a preponderance of the evidence standard when the defendant is a private party, *Georgia v. Tennessee Copper*, *supra*, 206 U.S. at 238-239, but a clear and convincing evidence standard when the defendant is a state, *New York v. New Jersey*, 256 U.S 296, 309 (1921); *Missouri v. Illinois*, 200 U.S. 496, 520-522 (1906).[28] In both *New York v. New Jersey* and *Missouri v. Illinois*, *supra*, 200 U.S. at 520-522, use of the higher standard was attributed to the sovereign status of the defendant. For example, in *New York v. New Jersey* the Court explained that

> the burden upon the state of New York of sustaining the allegations of its bill is much greater than that imposed upon a complainant in an ordinary suit between private parties. Before this court can be moved to exercise its extraordinary power under the Constitution to control the conduct of one state at the suit of another, the threatened invasion of rights must be of serious magnitude and it must be established by clear and convincing evidence.

New York v. New Jersey, *supra*, 256 U.S. at 309. Justice Harlan's opinion for the Court in *Ohio v. Wyandotte Chemicals*, *supra*, 401 U.S. at 501-502, 504-505, however,

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[27] For state law cases using this balancing test, *see*, *e.g.*, Davis, "Theories of Water Pollution Litigation," 1971 Wis. L. Rev. 738, 766-767 n. 130; *see also Harrison v. Indiana Auto*, *supra*, 528 F.2d at 1123 (diversity case). Wisconsin courts apparently do not use the test. Davis, *supra*, at 767-768 n. 134.

[28] *See also Missouri v. Illinois*, *supra*, 180 U.S. at 248.

carry the pathogens into Illinois waters, where they may infect drinking water supplies and pose a danger to swimmers, and therefore that defendants' actions pose a significant risk of injury to Illinois residents. These findings are not clearly erroneous. Rule 52, Fed. R. Civ. P. The evidence supporting the findings, which we have carefully reviewed,[31] may be summarized as follows:

Any population as large as Milwaukee's will include carriers of enteroviruses,[32] who will excrete the viruses. Therefore the sewage of a city as large as Milwaukee inevitably contains these viruses. Similarly, the sewage of any large city will also contain pathogenic bacteria.

The sewer systems defendants operate have a total of approximately 239 bypass or overflow points from which untreated sewage escapes to flow directly or indirectly into Lake Michigan or into rivers that empty into the lake.[33] Most of these overflow points are either pumping

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[31] In an unpublished order filed with this opinion we discuss the evidentiary support for the district court's findings of fact in detail. Since this factual discussion is of little precedential value, we omit it from this opinion in favor of a short summary. *See* Circuit Rule 35.

[32] Enteroviruses, sometimes referred to as enteric viruses, are those that inhabit the gastroenteric tract of human beings. Many of these viruses are pathogenic, causing diseases such as polio, pleurodynia, myocarditis, meningitis, and encephalitis.

[33] Both of the defendant commissions act as agents of the Metropolitan Sewerage District of the County of Milwaukee, a municipal corporation that holds title to all property acquired by either commission but is not a defendant in this case. The city commission is responsible for "disposal of the sanitary and industrial sewage generated within the City of Milwaukee and to this end has established and maintained a system of intercepting sewers within the City and . . . operates the Jones Island and South Shore treatment plants; . . . ." The county commission is responsible for "collection and transportation of sanitary and industrial sewage from outside . . . Milwaukee but within the service area of the Metropolitan Sewerage District . . . for disposal at the Jones Island and South Shore treatment plants, all subject to approval by the City Commission; . . . ." *See generally Wis. Stat. Ann.* § 59.96(6) (West). The City of Milwaukee seems to be solely responsible for the sewers within its boundaries, other than the intercepting sewers.

(Footnote continued on following page)

stations or what are called "gravity overflows." Both types are triggered by the level of sewage in the system. In the former, pumps are activated by electrodes inside the sewer when the sewage flow reaches the level of the electrodes; when the pumps are activated, raw sewage is either pumped into storm sewers, which empty into rivers that in turn empty into Lake Michigan, or dumped directly into the rivers. The gravity overflows are simply pipes placed inside the sewers; when the sewage level rises to that of the pipes, raw sewage pours out into either storm sewers or rivers and then into Lake Michigan. Since both types of overflow points are activated by the level of sewage, an overload or a blockage in the sewers that causes the sewage level to rise will cause overflows, even if the sewer capacity would otherwise be adequate. Because ground water and water from storm sewers sometimes "infiltrates" or flows into sanitary sewers, overflows from the sanitary sewers, as well as from combined sewers, are especially likely during wet weather. In a single month in 1976 the untreated sewage discharged from just 11 of the 239 overflow points totalled 646.46 million gallons.

In addition to the pathogens in the raw sewage that the defendants dump into Lake Michigan, pathogens are contained in the effluent that the South Shore and Jones Island treatment plants discharge directly and indirectly into Lake Michigan[34] when treatment of sewage at

[33] *continued*

There are 18 bypass points and 31 overflow points on the Metropolitan (or Main) Interceptor System, which is the network of sanitary sewers in the Milwaukee metropolitan area that carries sewage to the Jones Island and South Shore treatment plants. Sewage generated in the 26 municipalities within the area first flows into a "lateral sewer" and from there into "local collector sewers," which connect with the Metropolitan Interceptor System. There are 78 overflow points (called "crossovers") on Milwaukee's sanitary sewer system and 112 overflow points on the city's combination storm water and sanitary sewer system (called combined sewer overflows).

[34] South Shore effluent is discharged into Lake Michigan, but Jones Island effluent is discharged into the Milwaukee Harbor and from there flows into Lake Michigan.

those plants is inadequate, as it has sometimes been. Biochemical oxygen demand (BOD),[35] as an indicator of the presence of organic material, and the presence of suspended solids[36] are both significant factors in evaluating the adequacy of sewage treatment, especially as to virus and bacteria elimination.[37] EPA regulations and the discharge permits issued by the Wisconsin Department of Natural Resources for the Jones Island and South Shore plants require that the average daily BOD_5 (see note 35, *supra*) and suspended solids content of the effluent not exceed 30 milligrams per liter (mg/l) in any 30-day period. Not only were the 30-day average daily limitations frequently violated at Jones Island and South Shore, but also, on occasion, even if these limitations were met, discharges on individual days greatly exceeded the 30 mg/l limitation.[38]

The evidence established that, at temperatures between 40 and 70 degrees Fahrenheit, 90% of the bacteria discharged on any given day will generally

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[35] Biochemical oxygen demand (BOD) is an "index of the biodegradable organics present in the effluent." *Standard Methods for the Examination of Water and Wastewater*, 513, 544 (14th ed. 1975). BOD is generally "measured over a five-day period," *American Meat Institute v. EPA*, *supra*, 526 F.2d at 447, hence the abbreviation BOD_5.

[36] As the term suggests, "suspended solids" are "particles of organic and inorganic matter suspended in the water or floating on its surface." *American Meat Institute v. EPA*, *supra*, 526 F.2d at 447.

[37] Chlorine, contained in hypochlorous acid, is one of the most common disinfectants used in sewage treatment and is the only disinfectant used at either Jones Island or South Shore. Ammonia or nitrogen in organic material reacts with chlorine to form compounds that are either ineffective or less effective than hypochlorous acid as viricides and bactericides. Viruses or bacteria embedded in suspended solids, organic or inorganic, will be protected from effective chlorination.

[38] Both EPA regulations and the discharge permits impose seven-day daily average BOD_5 and suspended solids limitations of 45 mg/l. We note that on some occasions the defendants' individual day discharges absolutely precluded meeting the seven-day daily average.

"die-off" within two to four days, although they can survive for four to eight days. But, at temperatures between 40 and 50 degrees Fahrenheit, viruses will survive for months; even at 70 degrees, a temperature rarely reached by Lake Michigan except in July and August, viruses will survive for about two weeks. All of the witnesses who testified concerning the transport of pathogens discharged at Milwaukee into Illinois waters agreed that the southerly currents were strong enough and persisted long enough to carry the pathogens into Illinois waters in less than four days. They differed only as to the number of times that this could be expected to occur in a given year.

Pathogens discharged at Milwaukee will sometimes be carried into Illinois waters close enough to shore to come in contact with swimmers and to be taken in by water treatment plants. A swimmer can be infected by getting contaminated water into his mouth or nose or on a cut or abrasion on the skin. Drinking water can be contaminated by viruses or bacteria in lake water if a water treatment plant malfunctions because of human error or mechanical breakdown. Furthermore, there was evidence that viruses and bacteria can survive the treatment at a drinking water plant, even in the absence of error or breakdown. If viruses or bacteria contaminate the drinking water supplies, Illinois residents ingesting the water can of course become infected.

Defendants estimate that the effluent from Jones Island and South Shore contains about 1,100,000 pounds of phosphorus each year; the phosphorus content of defendants' raw sewage discharges is unmeasured. The district court found that this constituted a substantial contribution to the accelerated eutrophication of the water in the western in-shore zone of Lake Michigan, within the territorial boundaries of the State of Illinois, and also found that the State of Michigan was injured by accelerated eutrophication, aggravated by defendants' discharges.[39]

[39] "Eutrophication" is a natural process, and refers to the gradual increase of nutrient concentration in a body of water, which in turn causes increasing concentrations of phytoplank-

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V.

Sufficiency of the Evidence Supporting the Relief Granted

A. *Relief Granted by the District Court*

The district court's judgment order requires the defendants to eliminate all overflows, defined as any "crossover, bypass, diversion structure, relief structure, pump station or any other device or mechanism by which human fecal waste is discharged directly or indirectly to public streams, rivers or lakes without collection and treatment," located outside the combined sewer system area by July 1, 1986. [Appendix 2.] As to the 112 combined sewer overflows, the defendants must construct a collection and conveyance system with a storage capacity of 2605 acre-feet[40] by December 31, 1989. Any overflow from this collection and conveyance system must receive minimum "treatment" consisting of "bar screen" filtering, followed by "drum screen" filtering, and chlorination. [App. at 5.] Defendants must either modify existing sewage treatment facilities or construct new facilities to treat all sewage, including that collected in the combined sewer collection and conveyance system, in order to meet the following effluent limitations by December 13, 1986:

> (1) based on 30 consecutive daily samples, an average of 5 mg/l suspended solids, provided that no single sample exceed 10 mg/l suspended solids;

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[39] *continued*

ton and other living organisms. Man's nutrient inputs may, however, accelerate the evolution. Liminologists regard phosphorus as a "controlling element" in the process. Since phosphorus is necessary to support the growth of phytoplankton, limiting phosphorus imposes an upper limit on the external manifestations of eutrophication, which include reduction of clarity and oxygen content, production of obnoxious odors, and reduction of the quality of drinking water supplies.

[40] An "acre-foot" is "the volume that would cover one acre to a depth of one foot." *Webster's Third New International Dictionary* (unabridged) 19 (1971).

(2) based on 30 consecutive daily samples, an average of 5 mg/l BOD_5, provided that no single sample exceed 10 mg/l BOD_5;

(3) based on daily samples, a free chlorine residual after 15 minutes exposure using the amperometric test;

(4) based on daily grab samples, fecal coliform counts not exceeding 40/100 ml; and

(5) based on daily sampling, a monthly average of 1 mg/l phosphorus. [App. at 6-7.]

The order also provides for evidentiary hearings to secure modifications of the order or to determine whether the provisions of the order have been violated. In any such hearing the defendants must bear the burden of proving by a preponderance of the evidence that the modification is necessary or that any alleged violation of the order did not occur or was excused.

B. *Overflows*

That part of the district court's order requiring defendants to eliminate all overflows outside the combined sewer system by July 1, 1986 and to construct a collection and conveyance system for the combined sewer system that will practically eliminate overflows on the combined sewer system by December 31, 1989 is supported by the evidence and is reasonable.

1. *Overflows Outside the Combined Sewer Area*

There appear to be no provisions in the Act or EPA regulations expressly forbidding the discharge of raw sewage into public waters from overflow points. Yet such a prohibition is at least implicit in the provisions of § 301.[41] It would be senseless to prohibit the discharge of effluent from publicly owned treatment works not meeting the secondary treatment requirements of § 301(b)(1)(B), if raw sewage can nonetheless be dis-

[41] *See also* §§ 212(2)(A), (B), quoted in note 13, *supra*; § 70, 91 Stat. 1608, as amended, 33 U.S.C.A. § 1375(c); S. Rep. No. 95-370, *supra*, at 81, reprinted in [1977] *U.S. Code Cong. & Ad. News*, *supra*, at 4406.

charged at will from overflow points before it reaches the treatment works. The discharge permits that the Wisconsin agency issued for the South Shore and Jones Island treatment plants prohibit, except under very limited conditions, any "diversion or bypass" of raw sewage *at the treatment works.* [Wisconsin Pollutant Discharge Elimination System Permits (WPDES Permits): WI-0024775, Part I, p.4 of 6 (South Shore), P.Ex. 63; WI-0024767, Part I, p.4 of 6 (Jones Island), P.Ex. 62.] Although the discharge permits do not otherwise prohibit overflow discharges, the permits do require the city commission to "initiate" programs "leading to the elimination or control of all discharge overflow and/or bypass points . . . ." [WPDES Permits: WI-0024775, *supra*, Part II, p.7 of 8; WI-0024767, *supra*, Part II, p.5 of 6.] Under the permits, plans for the elimination or control of overflows were to be submitted to the Wisconsin agency by December 31, 1975. It is not clear from the record whether any plans were submitted, or, if they were, what their terms were and what action was taken.

In any event, the provisions of these permits appear to have been modified. In July, 1976, the defendant commissions filed an action in a Wisconsin state court against the Wisconsin Department of Natural Resources, the state's discharge permit issuing agency, challenging the validity of the requirements of the permits issued for South Shore and Jones Island. The state agency answered asserting the validity of the permit requirements and filed a counterclaim, alleging that the defendant commissions had violated the permit effluent limitations on numerous occasions. The state agency also alleged

> that under dry weather and wet weather conditions, bypassing and overflowing occur within the sewerage systems of the Commissions and such discharges must either be eliminated or meet secondary treatment standards by July 1, 1977 . . . .

[*Sewerage Commission of the City of Milwaukee and Metropolitan Sewerage Commission of the County of Milwaukee v. State of Wisconsin Department of Natural*

Resources, Stipulation 3 (Wis. Ct. Ct. Case No. 152-342, May 25, 1977), D.Ex. 1311.]

The state court suit was resolved by a settlement agreement, approved by the court on May 25, 1977, in which the sewerage commissions accepted the requirement that they eliminate *dry weather* bypasses and overflows on the Main Interceptor System by July 1, 1982 [*Id.* at 4], and complete construction of relief sewers by July 1, 1983 [*Id.* at 7, 8]. While construction of relief sewers and the other construction contemplated in the agreement presumably is intended to mitigate overflows, there is no specific date by which *wet weather* overflows must be eliminated. The sewerage commissions also agreed to "coordinate" a district-wide effort to "correct" wet weather bypassing and overflows on the separate sewer systems of the municipalities located within the Metropolitan Sewerage District of the County of Milwaukee, *see* note 33, *supra*. Under the agreement, any of the 26 municipalities within the district, by adopting a "resolution of commitment to the correction of wet weather related bypassing and overflowing within its sewerage system" becomes subject to the supervision of the commissions, which are required to make sure that all "corrective work" is complete by July 1, 1986. [*Id.* at 8-9, 15.] We need not decide whether modification of discharge permits in this manner complies with the procedural requirements of §§ 402(b)(3), (5), (6) or the substantive requirements of §§ 402(b)(1)(A), (B). For our purposes, it is sufficient that the state agency has condemned raw sewage discharges.

It is doubtful whether anyone, layman or expert, would argue that the discharge of raw sewage into public waters is a satisfactory alternative to collection and treatment of sewage, even though it may be conceded that it may take time to fund and provide collection and treatment facilities, and therefore the raw sewage discharges may have to be endured for the short term. Donald Wieland, Director of Engineering for the Sewerage Commission of the City of Milwaukee, flatly stated that discharging raw sewage into public waters as a permanent solution to sewage overloads was not "sound sanitary engineering practice":

Q. As a design engineer responsible for designing sewers with adequate hydraulic capacity, do you consider it sound sanitary engineering practice to design and install overflow devices which are intended to permit the discharge of raw sewage as a permanent solution to hydraulic overloads on an interceptor system?

A. Certainly not.

[Tr. 201.] Similarly, Dale Lundy, a hydraulic and sanitary engineering consultant called by plaintiffs, testified that collection and treatment is "considered preferable" to discharge of raw sewage. [Tr. 907.] Defendants point to nothing in the record that would even suggest that the discharge of raw sewage into public waters is either an acceptable long range solution to the problem of disposing of human wastes or a practice that can be regarded as safe.

The "crossover" overflow devices on the city's so-called "separate" system also fall within this aspect of the court's order. Rather than discharging raw sewage directly into public waters, the crossover devices dump the sewage into storm sewers which in turn dump it into the public waters. There may or may not be water in the storm sewers when the crossover devices are activated, and therefore the crossover overflow devices may result in discharges of raw sewage into public waters in precisely the same manner as the overflow devices that dump sewage directly into public waters.[42] We note that the discharge permit apparently issued to the City of Milwaukee by the Wisconsin agency, as modified, *see* note 33, *supra*, requires the city to "initiate a program leading to the elimination of the sanitary sewer crossovers (gravity) and the electrically operated relief pumps" on the city's "separate" sanitary sewer system "to assure attainment of all applicable Water Quality Standards." [Modification of Wisconsin Pollutant Discharge Permit No. WI-0026875, p.1 of 8 (December 17, 1976), D.Ex. 1110.]

[42] As to the significance of any dilution that might occur in the storm sewers *see* the discussion of combined sewer overflows, *infra*.

We have seen that, depending on the efficiency of the treatment, even effluent from a treatment plant may contain pathogens that pose a danger to Illinois residents and phosphorus that contributes to the accelerated eutrophication of the lake. Obviously then untreated sewage poses a greater danger. We therefore affirm the district court's order to the extent that it requires defendants to eliminate discharges of untreated sewage outside the combined sewer system area.

2. *Overflows Within the Combined Sewer Area*

In considering the city's combined sewer overflows, it is again appropriate to take as a starting point the provisions of the Act. Although there is no provision expressly prohibiting "combined sewer overflows," we think that such a prohibition can be inferred from the general provisions of § 301. For, as noted above, it simply does not make sense to read the statute as authorizing unrestricted discharges of untreated sewage; "dilution" by storm water does not constitute treatment. It seems apparent that the amount of dilution that has taken place when an overflow occurs depends entirely on what the relative volumes of sewage and water in the sewer happen to be at the time of the overflow. The overflow mechanisms do not regulate the amount of dilution or distinguish between pure and diluted sewage. If the total amount of sewage and water introduced into a sewer exceeds its capacity, the excess is discharged into the rivers and the lake; it may be either "diluted" or "undiluted." That the flow from the combined sewers is supposed to go to the treatment plants suggests that not even the city believes that the dilution in the combined sewers is sufficient to render the discharges harmless.[43]

EPA regulations concerning treatment plants that receive sewage from combined sewers recognize that

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[43] *See also* the expression of concern about combined sewer overflows in the Senate committee report accompanying the 1977 amendments, quoted *supra; see generally* the definition of treatment works, including "waste in combined storm water . . . sewer systems." § 212, quoted *supra*, note 13.

during wet weather it may be difficult for a treatment plant to meet secondary treatment effluent limitations, but those treatment plants are not exempt from the requirements of the regulations, and "diluted" sewage, like raw sewage, must be treated before being discharged:

> Secondary treatment may not be capable of meeting the percentage removal requirements . . . during wet weather in treatment works which receive flows from combined sewers (sewers which are designed to transport both storm water and sanitary sewage). For such treatment works, the decision must be made on a case-by-case basis as to whether any attainable percentage removal level can be defined, and if so, what that level should be.

40 C.F.R. § 133.03(a). Implicit is a recognition that dilution alone is inadequate to protect the receiving waters.

The discharge permit that appears to have been issued to the City of Milwaukee required the city to "initiate a program leading to the attainment of control of overflows from the City's combined sewer system . . . to assure attainment of all applicable Water Quality Standards." [Modification of Permit No. WI-0026875, *supra*, at p.5 of 8.] Although the City of Milwaukee was not one of the named plaintiffs in the state court litigation referred to above, the settlement agreement appears to modify this provision and to contemplate "completion of construction [on the combined sewer system] and achievement of applicable water quality standards by July 1, 1993." [*See* Stipulation, *supra*, at 10.] Again we need not decide whether a modification accomplished in this way meets the procedural requirements of the Act or whether the terms of the modification meet the substantive requirements of the Act. It is enough that neither Congress nor any agency charged with responsibility under the Act has approved the practice of discharging untreated sewage from a combined sewer system into public waters.

The requirements in the district court's order that the defendants collect and treat the sewage in combined

sewers before discharging it directly or indirectly into Lake Michigan is proper in light of the evidence. Defendants concede the feasibility of the completion date requirements. [App. at 16.]

3. *Illinois' Regulation of Overflows Within Its Own Jurisdiction*

Defendants attack the overflow elimination provision of the district court's order on the additional ground that Illinois does not even require elimination of sewage overflows within its own jurisdiction. Defendants cite § 602 of the Illinois Pollution Control Board Rules and Regulations, Chapter 3: Water Pollution [P.Ex. 171]. There is precedent, in a case of this kind, for considering the rules of the complaining state as an indication of what is appropriate for the protection of the residents of that state. *Missouri v. Illinois, supra*, 200 U.S. at 525-526.[44] The argument is, on its face, inapplicable to sanitary sewer overflows since Illinois does prohibit those. Illinois Pollution Control Board Rules and Regulations, *supra*, § 602(b) (1976) [P.Ex. 171];[45]

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[44] "Where, as here, the plaintiff has sovereign powers, and deliberately permits discharges similar to those of which it complains, it not only offers a standard to which the defendant has the right to appeal, but, as some of those discharges are . . . [at points where they could cause the injury complained of], it warrants the defendant in demanding the strictest proof that the plaintiff's own conduct does not produce the result, or at least so conduce to it, that courts should not be curious to apportion the blame." 200 U.S. at 525-526.

[45] Defendants point to one place in Illinois where sewage that has not been fully treated may be discharged into Lake Michigan, *viz.*, Waukegan. At present about twice a year and "ultimately about once a year" some sewage that has only received treatment consisting of 10 hours of sedimentation and chlorination will be discharged into Lake Michigan. [Tr. 13444-13445.] This discharge appears to be in violation of Illinois water pollution regulations, see Reply Memorandum of Plaintiff-Appellee State of Illinois 35, and therefore provides little support for defendants' contention.

consequently, we interpret defendants' argument to be that it was improper to order collection and treatment of sewage in the combined sewer system area.

Section 602(c) does not prohibit combined sewer overflows, but "all dry weather flows, and the first blush of storm flows" must meet applicable effluent limitations, which for Lake Michigan are comparable to those imposed by the district court, and new combined sewers are prohibited. *Id.*, § 602(c)(1).[46] Combined sewer flows equal to ten times the average "dry weather flow" must receive "primary treatment and disinfection with adequate retention time." *Id.*, § 602(c)(2). These requirements seem to be comparable to the treatment of overflows from the collection and conveyance system prescribed by the district court. The Illinois regulations further provide that if necessary to prevent sludge accumulation or oxygen level depression, flows greater than ten times the average "dry weather flow" must be treated by "retention and return to the treatment works or otherwise." *Id.*, § 602(c)(3). Thus, it appears that defendants' only complaint based on a comparison with the Illinois regulations relates to the size of the retention facility required by the court.

The details of the relief to be granted are in large part matters left to the trial court's discretion; in any event, the defendants do not provide us with evidence sufficient to justify disagreement with what the court found necessary or evidence sufficient to show that the marginal increase in cost of building a facility of the size required by the district court is significantly greater than the cost of building a facility of the size presumably contemplated by defendants. Furthermore, although Illinois permits some combined sewer overflows, it also, unlike the defendants, requires some treatment. The trial court is not limited by the law of the complaining state with respect to each detail of the relief to be granted.

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[46] The Illinois Pollution Control Board Rules and Regulations require all effluents discharged into Lake Michigan to meet a 5 mg/liter suspended solids standard and a 4 mg/liter BOD_5 standard. Ill. Pollution Control Board Regulations, *supra*, § 404(d) [P.Ex. 171].

C. *Effluent Limitations*

Neither the minimum effluent limitations prescribed by EPA pursuant to the provisions of the Act nor the effluent limitations imposed by the Wisconsin agency under the National Pollutant Discharge Elimination System limit a federal court's authority to require compliance with more stringent limitations under the federal common law. Nevertheless, those standards provide guidelines which a court should not ignore.

EPA regulations define "secondary treatment" in terms of resulting effluent quality, in part, as follows:

> (a) *Biochemical Oxygen Demand (five-day).* (1) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 30 milligrams per liter.
>
> (2) The arithmetic mean of the values for effluent samples collected in a period of 7 consecutive days shall not exceed 45 milligrams per liter.
>
> (3) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).
>
> (b) *Suspended Solids.* (1) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 30 milligrams per liter.
>
> (2) The arithmetic mean of the values for effluent samples collected in a period of 7 consecutive days shall not exceed 45 milligrams per liter.
>
> (3) The arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

40 C.F.R. § 133.102. As noted above, for publicly owned treatment works the Act requires no more than secon-

dary treatment until July 1, 1983, when they must implement the "best practicable waste treatment over the life of the [treatment] works." § 201(g)(2)(A); *see* § 301(b)(2)(B). While point sources must comply with any more stringent requirements of the states in which they are located, Wisconsin does not appear to have adopted any more stringent limitations; the discharge permits issued to the defendants in this case do not impose any more stringent limitations than those in EPA's regulations.

Both the South Shore and Jones Island plants must meet the following conditions under their discharge permits:

> (1) based on daily samples, a monthly average of 30mg/l BOD_5 and a weekly average of 45mg/l BOD_5, provided that neither the monthly nor the weekly average ever exceed 15% of the average BOD_5 content of the influent during the same period (85% removal);
>
> (2) based on daily samples, a monthly average of 30mg/l suspended solids and a weekly average of 45 mg/l suspended solids, provided that neither the monthly nor the weekly average ever exceed 15% of the average suspended solids content of the influent during the same period (85% removal);
>
> (3) based on twice weekly "grab samples," a monthly average fecal coliform count of 200/100ml and a weekly average fecal coliform count of 400/100ml;
>
> (4) based on daily samples, a monthly average of 1mg/l phosphorus; and
>
> (5) monitoring of both total residual chlorine and available "free" chlorine in the effluent, but no specific requirements.

[Permit No. WI-0024775 (South Shore) P.Ex. 63; Permit No. WI-0024767 (Jones Island) P.Ex. 62.] All of the effluent limitations imposed by the district court, except the phosphorus limitation, are significantly more stringent than those prescribed by EPA or in the discharge permits: in lieu of 30mg/l BOD_5 and suspended solids, the district court requires 5mg/l; in lieu of 200 fecal coliform cells per 100ml, the district court requires

40/100ml; in lieu of the monitoring requirement for chlorine, the district court requires a free chlorine residual 15 minutes after exposure. Further, as to BOD_5 and suspended solids, the district court imposes an absolute maximum of 10mg/l instead of the variable 85% removal requirement in the EPA regulations and the discharge permits.

These effluent limitations imposed by the district court all relate to the hazard presented to Illinois residents by Milwaukee's discharge of sewage containing pathogens. Although aware that these limitations could be consistently met only by constructing what are referred to as "advanced waste treatment" plants, the court found that such treatment was necessary to protect Illinois residents from the danger presented by Milwaukee's discharges. [Tr. 14248-14249.] We are unable to conclude, after a careful examination of the evidence cited by plaintiffs to justify the limitations imposed, that this evidence was sufficient.

We recognize that once liability has been established, a trial court has broad authority to fashion appropriate relief. This rule is particularly applicable in an area of law where the appropriate relief will invariably depend on the circumstances of each case. *See, e.g., Washington v. General Motors Corp.*, 406 U.S. 109, 115-116 (1972). Nevertheless, a court, unlike a legislature or an administrative agency, is not free to rest solely upon what it thinks desirable; there must be evidence to support its conclusion that the relief granted is necessary to protect the complaining party from harm.[47]

To support the 5 mg/l BOD_5 and suspended solids limitations imposed by the district court, Illinois relies on the testimony of one witness who asserted that even at 30 mg/l suspended solids "you are going to have a lot of organics tied up with solids that is going to use up your

[47] *Cf. Milliken v. Bradley*, 433 U.S. 267, 280 (1977) ("[L]ike other equitable remedies, the nature of the desegregation remedy is to be determined by the nature and scope of the constitutional violation . . . . The remedy must therefore be related to 'the condition alleged to offend the Constitution . . . .' ").

chlorine, and that the chlorine can't even get into." Further, Illinois cites the general testimony that organic matter and suspended solids interfere with effective chlorination and therefore should be reduced as much as possible. Illinois also relies on the testimony of one witness that the kind of treatment required to meet the 5 mg/l standard is preferable to the kind of treatment now used by the defendants. And finally, Illinois points to evidence that one of the defendants' consultant sanitary engineers recommended treatment comparable to that required to meet the 5 mg/l standard, that three cities have been required to meet similar limitations, and that several cities have voluntarily decided to modify their own treatment facilities in ways similar to that which would be required under the district court's order.[48]

The evidence shows that suspended solids and organic matter interfere with chlorination, and therefore that there is some correlation between suspended solids and BOD_5 and effective chlorination. The evidence does not, however, show how much more effective chlorination would be a 5mg/l suspended solids and BOD_5 than at 30mg/l suspended solids and BOD_5; the difference may be significant or it may be *de minimis*.[49] [Compare Tr. 12398-12400 with Tr. 13399-13400.]

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[48] We only summarize the evidence in this opinion; the evidence relied on by Illinois is discussed in detail in the unpublished order filed with this opinion. *See* note 31, *supra*.

[49] Wellings testified that tests had failed to demonstrate any viruses in effluent containing only 5 Jackson Turbidity Units per liter. [Tr. 12399.] But Wellings' work focused primarily on the virus content of effluent from treatment facilities and not on removal efficiencies. [Tr. 13399.] For the purpose of determining whether significant benefits will result from reducing solids and BOD_5 from 30 mg/l to 5 mg/l, it is not enough to know that tests have shown viruses in effluent from a plant designed to meet the 30 mg/l standard and similar tests have failed to show viruses in a plant designed to meet the 5 mg/l standard. Nor is it enough to take random influent samples and random effluent samples, for the virus content of the sewage necessarily varies. Virus content in the influent may be much more significant than the particular solids or

(Footnote continued on following page)

That a few cities have adopted the more stringent standards is hardly enough to prove that those standards are necessary here, especially when the persons to be protected are many miles down the lakeshore from the discharge points. *Cf.* Comptroller General of the United States, "Report to Congress: Better Data Collection and Planning is Needed to Justify Advanced Waste Treatment Construction" (1976) [D.Ex. 1105] (pointing out that several cities began construction of advanced waste treatment facilities without adequate consideration of the expected costs and benefits of such facilities).

Our difficulty with the evidence reviewed above is that it consists merely of conclusions of the experts and does not explain why the particular standards are necessary to protect the health of Illinois residents.[50] We are asked to accept the conclusions on faith. It is difficult for us to see how the opinion of an expert can be intelligently appraised unless it is supported by reasons.

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[49] *continued*
BOD_5 level the plant is designed to achieve. Furthermore, the flow rates at the time the tests are conducted are important, for it is virtually meaningless to say that a plant designed to meet the 5 mg/l standard performs better than an overloaded plant designed to meet the 30 mg/l standard. [*See* Tr. 12377-12378 (Wellings).]

[50] While Wellings, who comes the closest to providing evidentiary support for the suspended solids limitations the court imposed, testified that "the problem with 30 milligrams per liter is you are going to have a lot of organics tied up with solids that is going to use up your chlorine, and the chlorine can't even get into," and there would "still" be "a problem with disinfection," she did not say the same would be true of any figure between thirty and five. She went on to say that she did not "know how she would equate Jackson Turbidity Units [on which her relevant experience was based] with milligrams, . . . because you would have to know size, shape and all that, source, because of the test itself," and then said 5 mg/l "would be well in the ball park," and she "wouldn't want any more than five." This is a speculative and uncertain basis for the court's implied conclusion that effluent limitations specifically adopted by EPA and the Wisconsin agency are insufficient to protect the health of people more than 25 miles from the discharge points. *See also* note 49, *supra*.

This is especially so when the opinion is offered to support effluent limitations markedly lower than (a) those established by EPA in its regulations, (b) those established by the state permit authority with the duty of protecting residents in the immediate environs of the discharges, and (c) those established by the complaining state itself for waters other than Lake Michigan.[51] The record is conspicuously silent as to the reasons these less stringent standards were found adequate to protect persons in the immediate environs of the discharges by experts who were presumably as dedicated to the protection of public health and the environment as those on whose conclusions plaintiffs rely, and why those reasons are inapplicable here, especially when the discharges occur at least 25 miles from any of the persons to be protected. In short, plaintiffs point to nothing in the record, and we have found nothing, to connect the effluent limitations imposed by the district court with the protection of Illinois residents. If enforcement of the limitations imposed in the discharge permits proves inadequate to protect Illinois residents, then more stringent limitations may become necessary. But on the record before us, we cannot sustain the district court's order in this respect.[52]

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[51] Illinois Pollution Control Board Rules and Regulations, *supra*, § 404 [P.Ex. 171].

[52] In the statement of facts contained in Illinois' first brief we were told: "Not only does sewage provide the basic element of phosphorus [which is necessary for eutrophication], but also it contains a whole series of nutrients . . . 'a very rich nutrient broth' for aquatic plant growth (Tr. 2889)." Illinois does not, however, attempt to sustain the effluent limitations imposed by the district court on this basis. Indeed, it is not even clear that this "fact" is relevant to the effluent limitations. There does not appear to be any evidence as to the relative "nutrient" content of effluent from treatment works designed to meet the 30 mg/l suspended solids and BOD_5 standards and those designed to meet the 5 mg/l standards. Presumably, the nutrient content of effluent from a plant meeting the 5 mg/l standards is lower than that of a plant meeting the 30 mg/l standards. But whether the difference is significant with respect to eutrophication of Lake Michigan is not clear.

Also relevant to this aspect of the remedy is Congress' treatment of publicly-owned treatment facilities in the 1972 and 1977 amendments to FWPCA. Secondary treatment facilities, which are not capable of meeting the 5 mg/l limitations, are permitted under 33 U.S.C. § 301(b)(1)(B) until July 1, 1983, when "the best practicable waste treatment over the life of the works" becomes the requirement. Although Congress did not attempt to answer the public health questions, leaving them to EPA and state agencies acting under EPA's supervision, the provisions of the Act are at least an indication of Congressional reluctance to risk pushing municipalities beyond the limits of their resources. The 1977 amendments, summarized above, show a deepening concern on this score. Congress' position in the Act does not, as we have held, mark the limits of our power in this common law nuisance action, but the policy underlying that position, to which we should give some deference, is at least a reason not to allow the nature of the action to cause a relaxation of the requirements of evidentiary foundation that would normally be observed in other kinds of actions.[53]

It is not clear whether the fecal coliform limitation and the free chlorine residual requirement imposed by the district court can be met with secondary treatment. In any event, the record support for these limitations is as deficient as it is for the suspended solid and BOD_5 limitations, and we are provided with no explanation of why such limitations were not included in the NPDES permits for the plants and the federal regulations.[54]

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[53] Plaintiff also relies on Illinois statutory and common law. The district court indicated that under any of the asserted grounds for relief the result would be the same. [App. 20-21.] But it is federal common law and not state statutory or common law that controls in this case, *Illinois v. Milwaukee*, *supra*, 406 U.S. at 107 & n. 9, and therefore we do not address the state law claims.

[54] In addition we note that Illinois' general effluent standard fecal coliform limitation is 400/100 ml. *See* Illinois Pollution Control Board Rules and Regulations, *supra*, § 405 [P.Ex. 171]. The "water quality" fecal coliform limitation for Lake

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Our treatment of the effluent limitations imposed in the district court's order is not inconsistent with our treatment of the overflow requirements of the order. First, and we think most important, the evidence presented supports the district court's finding that the defendants' discharges of raw sewage, whether diluted or not, pose a significant risk of injury to Illinois residents. Raw sewage contains vastly higher concentrations of pathogens than treated sewage. Millions of gallons of raw sewage are dumped into the water each year from the 239 overflow points on the defendants' sewage systems, most frequently during wet weather, but also during dry weather. Lake currents can and do sometimes carry the pathogens into Illinois waters close to shore.

Second, no one even attempts to justify such discharges as harmless or insignificant. As we have said, it is arguable that the Act itself prohibits discharges of raw sewage. The Wisconsin agency has taken steps to eliminate some overflows and to "correct" others although giving the defendants a longer time to take the necessary action than did the district court. But as stated above the defendants have conceded that compliance with the deadlines imposed by the court is feasible.

On the other hand, the evidence supporting the effluent limitations is weak, at best. They are more stringent than those required by Congress, EPA, and the Wisconsin discharge permit issuing agency. And there is no evidence as to why the limitations deemed adequate to protect the inhabitants in the vicinity of the discharges are inadequate to protect the residents of Illinois who are at least 25 miles away.

The phosphorus limitation imposed by the district court can be achieved using secondary treatment; an

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[54] *continued*
Michigan is 20/100 ml. Ill. Pollution Control Board Rules and Regs., *supra*, § 206(d) [P.Ex. 171]. For the effect of a more stringent water quality limitation than effluent limitation *see id.* § 201(a) [P.Ex. 171]. There does not appear to be any effluent limitation specifically requiring a chlorine residual, either "free" or total.

identical limitation is prescribed in the defendants' discharge permits.[55]

We affirm the district court's order to the extent that it requires the elimination of all sewage overflows and imposes a 1 mg/l phosphorus effluent limitation. We reverse the court's order insofar as it imposes suspended solids, BOD_5, fecal coliform, and free chlorine residual effluent limitations more stringent than those prescribed in defendants' discharge permits. The case is remanded to the district court with directions to modify the injunctive order in conformity with the rulings of this court.

AFFIRMED IN PART,
REVERSED AND REMANDED IN PART.

A true Copy:

Teste:

Clerk of the United States Court of Appeals for the Seventh Circuit

[55] Illinois' phosphorus effluent standard is 1 mg/l; its water quality standard for Lake Michigan is .007 mg/l. *See* Illinois Pollution Control Board Rules and Regulations, *supra*, §§ 407, 206(c) [P.Ex. 171].

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UNITED STATES COURT OF APPEALS

For the Seventh Circuit
Chicago, Illinois 60604

ARGUED: May 24, 1978
SUBMITTED: October 12, 1978
April 26, 1979.

Before
Hon. THOMAS E. FAIRCHILD, Chief Judge
Hon. PHILIP W. TONE, Circuit Judge
Hon. ROY W. HARPER, Senior District Judge*

PEOPLE OF THE STATE OF ILLINOIS,
Plaintiff-Appellee,

and

PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

No. 77-2246 vs.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendant-Appellants.

Appeal from the United States District Court for the Northern District of Illinois, Eastern District

No. 72-C-1253
John F. Grady, *Judge*

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* The Honorable Roy W. Harper, Senior District Judge for the Eastern and Western Districts of Missouri, is sitting by designation.

ORDER

This order supplements our published opinion and should be read in connection with that opinion; the order is not complete in itself. Since the subjects of this order are only the evidentiary support for the district court's findings of fact and the evidence relied on by Illinois to support the 5 mg/1 BOD_5 and suspended solids effluent limitations, they do not meet the criteria for publication stated in Circuit Rule 35.

I.

Sufficiency of the Evidence Supporting Findings of Fact

A. Discharges of Sewage Containing Pathogens

The District Court found that the defendants dump significant amounts of sewage containing pathogens into Lake Michigan. [Tr. 14214.] Milwaukee cannot seriously contend that the evidence was insufficient to support this finding.

1. Discharges of Raw Sewage

In its Wisconsin Pollutant Discharge Elimination System permit applications for the Jones Island Sewage Disposal Plant (Jones Island plant) and the South Shore Waste Water Treatment Plant (South Shore plant), both dated November 7, 1973, the City Commission listed 18 bypass points and 31 overflow points on the Metropolitan (or Main) Interceptor System from which untreated sewage would flow directly or indirectly into Lake Michigan and rivers that flow into the lake. [Plaintiff's Exhibits (P.Ex.) 62 and 63.] The discharge permits issued for the plants require the commission to submit quarterly reports showing the discharges from selected overflow points. [P.Ex. 62 (Jones Island plant: Permit No. WI-0024767, Part II. D.6, d.); P.Ex. 63 (South Part II. D.6, d.); P.Ex. 63 (South Shore plant: Permit No. WI-0024775, Part II. E.7, c.).] The commission's report for the first quarter of 1976 indicates that in March the discharges from just 11 overflow points was 646.46 million gallons of untreated sewage. [P.Ex. 56; see P.Ex. 55 (2d

quarter 1976 discharge report).] At trial, Donald Wieland, Director of Engineering for the Commission, testified that "diluted," but untreated, sewage flowed from the overflow points into Lake Michigan and Milwaukee rivers.

The City of Milwaukee's local sewer system[1] consists of two parts: (1) a so-called "separate sewer system," which carries only sewage to the Metropolitan Interceptor System, and (2) a "combined sewer system," which carries storm water and sewage to the Metropolitan Interceptor System. [Tr. 384; 386-387; 390-391; 426-428.] The separate sewer system has 78 overflow points (called "crossovers") at which the raw sewage flows into the city's storm sewers and then into either Lake Michigan or rivers that flow into the lake. [Tr. 428; 437-438; 448-449.] An additional 112 overflow points are built into the combined sewer system (called combined sewer overflows or "CSO overflows") at points where the combined sewer system connects with the Metropolitan Interceptor System. [Tr. 153-157; 386-387.] If the flow from the combined sewer is greater than the Metropolitan System can accommodate at the overflow point, the storm water and raw sewage are discharged into rivers that flow into Lake Michigan. [Tr. 153-155; 386-387.]

Most of the overflow points are either pumping stations or what are called "gravity overflows." [Tr. 134-135; 398; 442-444; 448-451.] "These pumping stations are installations of pumps that are activated by electrodes so that when the water level in a sewer system gets to a certain point ... the pumps will automatically start operating and discharge the flow into a storm sewer [which empties into a river that flows into the lake] or directly to a water course [that flows into the lake]." [Tr. 134.] At the gravity overflows, "[w]hen the sewage reaches a certain level in the ... sewer system, it reaches a bypass pipe, and runs off into, again, either a storm sewer or the surface waters." [Tr. 134-135; see 230-232.] Because these overflow points are

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[1] Although the City apparently received a discharge permit covering these sewers, the only evidence of that permit we find in the record is a modification. [D. Ex. 1110; *see also* Tr. 156.]

triggered by the level of sewage, a blockage in the sewers that causes the sewage level to rise will activate the pumps or cause the sewage to flow through the pipes that lead into the water or storm sewers, even if the sewer capacity would otherwise be adequate. In some places on the Metropolitan Interceptor System, pipes of large diameter are connected to pipes of a smaller diameter, which causes an overflow whenever the larger pipe carries an amount exceeding the capacity of the smaller pipe. [Tr. 139-140; 333-334.] Ground water and water from the storm sewers sometimes "infiltrates" or flows into the sanitary sewers, increasing the liquid flow [Tr. 148, 152], and therefore during wet weather overflows are especially likely.

In addition, the City of Milwaukee and its Sewerage Commission operate two "flushing tunnels" that clean the Milwaukee and Kinnickinnic Rivers by pumping water from Lake Michigan to upstream points in the two rivers and letting the water flow back into the lake. The purpose and effect of this flushing are to increase the flow of the two rivers and thereby wash any sewage deposited in the rivers down into Lake Michigan. [Tr. 379-383; P.Ex. 162 (Kinnickinnic River).]

2. Discharges of Inadequately Treated Sewage

The district court also found that because sewage is often inadequately treated at both the Jones Island plant and the South Shore plant, the effluent from those plants also sometimes contains pathogens.[2] [Tr. 14214.] Effluent from the Jones Island plant is discharged into the Milwaukee Harbor, and flows from there into Lake Michigan. Effluent from the South Shore plant is discharged directly into the lake.

In evaluating the performance of the two plants, the district court relied on two indicators: (1) five day biochemical oxygen demand of the effluent (BOD_5), and (2) suspended solids remaining in the effluent. [Tr. 14214-14215.]

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[2] The evidence supporting the court's finding that sewage contains disease causing viruses and bacteria is discussed below.

BOD_5 and suspended solids are generally recognized to be significant factors for evaluating the degree of pollution in water. *See, e.g.*, Sawyer, "Activated Sludge Modifications", 32 *Jl. W.P.C. Fed.* 232, 235-241 (1960) [Defendant's Exhibit (D.Ex.) 1208]. Every applicant for an NPDES permit under the Act must submit data showing the BOD_5 and the suspended solids content of the applicant's discharges. [*E.g.*, P.Ex. 62 (EPA, National Pollutant Discharge Elimination System: Application for Permit to Discharge Wastewater, Standard Form A — Municipal, question 14).]

BOD_5 and suspended solids are particularly significant indicators of plant performance when the issue is whether the effluent contains significant numbers of viruses or bacteria. BOD_5 is an indirect measure of the biodegradable organics in the effluent. See *Standard Methods for the Examination of Water and Wastewater*, 513, 544 (14th ed. 1975). Chlorine, contained in hypochlorous acid, is the only disinfectant used at either the Jones Island plant or the South Shore plant. [P.Ex. 62, 63.] Ammonia or nitrogen in organic material will react with chlorine to form compounds that are either ineffective, or less effective than hypochlorous acid as viricides and bactericides. [Tr. 12064-12067, 3083-3084, 3086, 2204-2205.] *See* Sproul, "Removal of Viruses by Treatment Processes," in Berg, et al. (ed.), *Viruses in Water* 167, 173-175 (1976) [P.Ex 140]. A relatively high BOD_5 implies the presence of a significant amount of organic material, which will render chlorine either ineffective or less effective as a viricide and bactericide. Suspended solids, either organic or inorganic, may contain significant numbers of viruses and bacteria. [Tr. 12067-12071, 12,378, 12,398, 3083-3084, 2205.] Even chlorine not rendered less effective by the presence of organic material cannot "penetrate very far" into suspended solids to "kill embedded virus." [Tr. 12067-12068; *see id.* 12,398.] Thus, a large amount of BOD_5 and suspended solids in the effluent indicates that any chlorine added to the sewage entering the treatment plant will be ineffective or less effective, thereby increasing the likelihood that disease causing viruses or bacteria in the influent remain in the effluent. [See Tr. 12398, 12401-12402, 3083-3085.]

Under the discharge permit issued by the Wisconsin Department of Natural Resources for the Jones Island and South Shore plants, the average daily BOD_5 and suspended solids content of the effluent may not exceed 30 miligrams per liter (mg/l) in any 30-day period. [P.Ex. 62 (Permit No. WI-0024767, Part II, "Daily Effluent Limitations"); P.Ex. 63] EPA regulations adopted pursuant to the Act established the same maximum levels for BOD_5 and suspended solids. 40 C.F.R. §133.102 (a),(b).

There are two respects in which the operation of the plants was shown to have resulted in the discharge of inadequately treated sewage into the lake. First, the permits' 30-day average limitations of 30 mg/l have sometimes been violated by the plants.[3] Second, whether or not the 30-day average limitations were met, discharges on individual days were greatly in excess of the permissible monthly average of 30 mg/l per day.[4]

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[3] The Jones Island plant failed to meet the suspended solids limitation in each of the first three months of 1974. In 1975 that plant failed to meet the BOD_5 limitation in five months and the suspended solids limitation in eight months. In 1976 the plant met the BOD_5 limitation in 12 months but the suspended solids limitation in only six months. [P. Ex. 123, 125.]

Similar violations of the permit limitations for the South Shore plant appear in the records for 1975 (BOD_5 limitation met in only five months; suspended solids once) and 1976 (BOD_5 limitations met in seven of 11 months recorded but suspended solids in only two of those months). [P. Ex. 92, 93, 94.]

[4] In 1974, while meeting the 30-day average for BOD_5 in all periods, the Jones Island plant ran as high as 98 mg/l on one day. The high for an individual day's suspended solids count that year was 329 mg/l. [P. Ex. 125.] In 1976 the plant recorded a BOD_5 count as high as 170 mg/l and a suspended solids count as high as 392 mg/l for individual days. [P. Ex. 123, 125.] In the first four months of 1977, Jones Island recorded a BOD_5 count as high as 100 mg/l and suspended solids counts as high as 388 and 237 mg/l. [D. Ex 1302, 1303.]

(Footnote continued on following page)

An expert called by plaintiffs who had studied the virus content of effluents from several sewage treatment plants in Florida [Tr. 12291-12293], Flora Wellings, Director of the Epidemiology Research Center in Tampa, Florida, testified that if the suspended solids content of the effluent was 199 mg/1, a count frequently exceeded on a daily basis by both plants, "You are still going to have a lot of virus coming through...." and chlorination would not be effective. [Tr. at 12397.] Dr. Wellings characterized 15-30 mg/1 of suspended solids as "very low." [Tr. 13349-13350.] But she also pointed out that even at 30 mg/1 there would be a "lot of organics," which would either combine with the chlorine rendering it a less effective viricide or protect embedded viruses from any chlorine at all. [Tr. 12398.] In light of the operating reports from Jones Island and South Shore reviewed above, it is apparent that if Milwaukee's sewage contains pathogens, some of them are likely to survive the treat-

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Footnote 4 (continued)

The South Shore plant experienced similar problems. In 1975, its highest BOD_5 count for an individual day was 372 mg/1 and its highest suspended solids count 1,115 mg/1. [P. Ex. 92.] In 1976 on individual days the plant's BOD_5 count exceeded 300 mg/1 and its suspended solids count reached 340 mg/1. [P. Ex. 93, 94.]

In comments to a monthly report during a four month period in which the Jones Island plant never met the suspended solids limitation, the plant managers said,

> The average effluent suspended solids concentration in excess of the 30 mg/1 limitation are due to the continued inability to remove solids as they are generated. Ideally, the mixed liquor suspended solids should be in the range of 2000 mg/1 to 3000 mg/1 with present plant loadings. During the month of February, the mixed liquor suspended solids averaged 4300 mg/1 with a maximum day's average of 4800 mg/1.

[D.Ex. 1302, Comments for the February 1977: WPDES Permit No. WI-0024767, at 1; *see also* comments for March and April, 1977 in D.Ex. 1302.]

ment at these plants and be discharged into Lake Michigan, as the court found.

3. Presence of Pathogens

The evidence established that pathogens are found in the sewage discharges of every urban center, although the record contains no evidence on the subject with respect to Milwaukee in particular.

Joseph Melnick, Professor of Virology and Epidemiology at the Baylor College of Medicine, testified that "every city the size of Milwaukee will have carriers of enteroviruses in the city who will be excreting viruses into the sewage." [Tr. 2206; see *id.* 2174, 2175.] Edwin Geldreich, Director of EPA's Microbiological Treatment Branch in Cincinnati, Ohio [Tr. 3048], testified to the same effect with respect to both viruses and bacteria. [Tr. 3101.] Experts studying enteroviruses in waste water estimate that untreated sewage will contain an average of 7000 infectious virus particles, or plaque forming units, per liter. [Tr. 2184-2185.] *See* Sproul, *supra* at 176 [P.Ex. 140]. Defendants' expert, Dean Cliver, Professor, Food Research Institute and Department of Bacteriology, University of Wisconsin, acknowledged on cross-examination that one gram of feces from an infected person "could contain literally millions of enteric viruses" [Tr. at 10278], *i.e.*, viruses that inhabit the gastroenteric tract of a human being. Many enteric viruses cause diseases in humans, including polio, pleurodynia, myocarditis, meningitis, and encephalitis. [Tr. 2163-2170; see *id.* 2188.] Although plaintiffs did not conduct tests to demonstrate that on a particular day Milwaukee's sewage contained disease-causing viruses, there was evidence that known tests are difficult and ineffective for determining the presence of some such viruses. The omission is not fatal, for the evidence presented adequately supports the court's inference that Milwaukee's sewage contains disease-causing viruses and bacteria.

Although it is possible to test water for the presence of specific pathogenic microorganisms, [Tr. 3099;] *Standard Methods for the Examination of Water and Wastewater,*

954-966 (14th ed. 1975), there are practical difficulties in conducting such tests on a large scale. Therefore, those studying water pollution have generally focused on various "indicator organisms" rather than on the pathogens themselves. *See Standard Methods, supra,* 875, 954-955. [Tr. 3056-3064, 3099-3100.] Fecal coliform is one commonly used "indicator organism." [Tr. 3097-3100.] As the number of fecal coliform present in water increases, so too does the probability that the water will contain pathogenic bacteria. [Tr. 3102-3103.] Geldreich testified that although the relationship between the number of fecal coliform present in a water sample and the number of salmonella, one of the most common bacterial pathogens, has not been established, if in 100 samples there are 1000 fecal coliforms/100 milliliters (ml), then in about 95 of those same samples salmonella will also be found. [See Tr. 3097-3098, 3102.] Geldreich cautioned, however, that negative results cannot be relied on to assure the absence of either pathogenic viruses or pathogenic bacteria. [Tr. 3101; see *id.* 2201; 12083-84.]

The fecal coliform counts in the sewage discharged from the overflow points on defendants' sewage collection system is sometimes as high as 23,000,000 per 100 ml. [P.Ex. 55 (Overflow # 036 Menomonee and North, May 16, 1976; *id.* June 14, 1976); see Tr. 3117-3118.] While warm-blooded animals other than man contribute to the fecal coliform content of Milwaukee's raw sewage discharges [Tr. 3114-3115], their contribution is likely to be relatively minor. It is highly probable that Milwaukee's sewage contains significant numbers of pathogenic viruses and bacteria.

Furthermore, the operating data for both the Jones Island plant and the South Shore plant indicate that the fecal coliform count in the effluent often exceeds 1000/100 ml. In March 1977, the effluent fecal coliform counts at Jones Island exceeded 1,000/100 ml on six of the 14 days measured, with a high of 17,000/100 ml. [D.Ex. 1303, see also P.Ex. 123 (Operating data for 1975).]

For the same reasons pathogenic viruses are likely to survive the treatment at these two plants, pathogenic bacteria are likely

to survive. [See Tr. 3082-3085.] The operating data for the two plants showing high fecal coliform counts in the effluent confirm this conclusion since effective chlorination presumably would also reduce fecal coliform.

B. Transport of Sewage Discharged at Milwaukee to Illinois Waters

The district court found that "bacteria and viruses numbering literally in the millions are transported live and intact from Milwaukee to Illinois waters." [Tr. 14217.] This finding is not clearly erroneous.

Geldreich testified that at temperatures between 5 and 20 degrees centigrade (Celsius), 41 and 68 degrees Fahrenheit, 90% of the total number of bacteria discharged on a given day will die within 2 to 4 days. [Tr. 3092.] There are two factors, however, that may either extend the time during which bacteria discharged on a particular day will affect the receiving body of water or increase the significance of the discharge on a given day: "persistence" and "regrowth." If there are sufficient nutrients "and a set of conditions" in the receiving body of water, then bacteria may "persist" at the original density for a period of 2 to 4 days before beginning to "die-off." [Tr. 3092-3095.] Thus, bacteria may live for a period of 4 to 8 days. [Tr. 3095-3096.] Geldreich testified that "persistence" is likely to occur in improperly treated or untreated sewage. [Tr. 3094-3095.] As the term "regrowth" suggests, bacteria may reproduce after being discharged into a body of water, provided of course that there are sufficient nutrients available. [Tr. 3093-3094.] Geldreich testified that such "regrowth" may result in the production of ten times the original number of bacteria. [*Id.*]

As to the die-off rate for enteric viruses, Melnick testified that at temperatures of 70 degrees Fahrenheit, viruses will survive for approximately two weeks, but at temperatures of 40-50 degrees Fahrenheit, they will survive for "months." [Tr. 2199-2200.] In colder water, viruses may live indefinitely. [*Id.*] If currents along the shore of Lake Michigan from Milwaukee

to Illinois travel at speeds sufficient to reach Illinois in less than 4 to 8 days, then bacteria or viruses discharged at Milwaukee will be carried "live and intact to Illinois waters."

The distance from the center of Milwaukee Harbor, where the Jones Island plant is located, to the Illinois border is about 37 statute miles, about 60 kilometers (km) [Tr. 2379, 2010]; from the South Shore plant the distance is only about 25 statute miles, about 40 km [*See* Tr. 8944-8945]. Captain James Verber, an oceanographer specializing in water transport and water movement, testified that data collected under his supervision between 1962 and 1964 indicate that currents between Milwaukee and Illinois will travel toward the south at speeds sufficient to carry suspended pollutants 40 miles about 12 times each year. [Tr. 2392.] More specific was Verber's testimony that during the period he studied there were six occasions on which the current flowed south for 7.5 days at a rate of about 10 centimeters per second (cm/sec), and therefore covered a distance of about 50 miles. [Tr. 2379-2381.] There were other occasions on which the current traveled about 40 miles in 2.5-4.9 days. [*Id.*] On one occasion the current traveled at a rate of 40-51 cm/sec, covering the distance in about 1.75 days. [*Id.*] Verber testified that the data presented in Sato & Mortimer, "Lake Currents and Temperatures Near the Western Shore of Lake Michigan" [P.Ex. 38], indicate that the frequency of transport from Milwaukee to Illinois might be greater than 12 in some years. [Tr. 2392.] Verber pointed out that the data showed one occasion when the currents from Milwaukee to Illinois persisted for 19 days and during that period at speeds sufficient to cover the 40 miles in less than 4 days. [Tr. 2382.]

Gabriel Csanady, an oceanographer for the Woods Hole Oceanographic Institution, also estimated that currents carrying pollutants would flow from Milwaukee to Illinois for sufficiently long periods of time and at sufficient speeds to cover the 37 miles about 12 times a year. [Tr. 2058-2060.] Csanady testified that currents persisted in one direction on an average of about 4 days, sometimes as long as 7 days and frequently for 1 or 2 days. [Tr. 2011, 2032, 2034.] See Csanady, "Diffusion and Dispersion", Part 2 in 2 *Environmental Status of the Lake Michigan*

Region, 103, 115-116 (1975) [P.Ex. 201]. Csanady also testified that wind driven current speeds of 30 cm/sec or 16 miles per day were "typical" in Lake Michigan, but speeds of 50 cm/sec or 27 miles per day also have been recorded. [Tr. 1950-1952, 2009.] *See* Diffusion and Dispersion, *supra,* at 116 [P. Ex. 20].

Even defendants' experts, Donald Pritchard and Harry Carter, testified that currents between Milwaukee and Illinois flow toward the south for sufficient periods at rates sufficient to carry water from Milwaukee across the Illinois border on an average of four times per year. [Tr. 7168 (Pritchard); 8666-8671 (Carter); see D.Ex. 905 (Table 1); D.Ex. 1163 (Tables 2 and 4).] A table prepared by Carter and headed "Southerly Flows Sufficiently Long and/or Strong to Transport Effluent from Milwaukee to Illinios" [D.Ex. 905, Table 1], shows that in the period studied there were four occasions on which effluent released at Jones Island would have traveled across the Illinois border; the table shows that on these four occasions the effluent would have crossed into Illinois waters after about 4 days, 6 days, 5 days, and 2 days. [D.Ex. 905.] There were at least seven occasions on which effluent released at South Shore would have traveled the shorter distance into Illinois waters. [D.Ex. 1163, Table 4.]

If, as the experts testified, bacteria discharged into Lake Michigan will survive for a period of four to eight days and viruses will survive for a minimum of two weeks and longer in periods of cool temperatures, then currents sufficient to travel the distance between Milwaukee to Illinois in less than four days will carry bacteria and viruses into Illinois waters. Defendants contend, however, that there are four factors that are not accounted for in the die-off rates for bacteria and viruses given by plaintiff's experts: (1) sedimentation, (2) biological inactivation, (3) predation, and (4) ultraviolet radiation. These factors assertedly reduce the number of bacteria or viruses that would survive the trip from Milwaukee to Illinois.

Defendants contend that sedimentation operates to reduce the number of bacteria and viruses that travel to Illinois at several points along the way. First, the Jones Island effluent is

discharged into the Milwuakee Harbor, which allegedly serves as a settling basin. [Tr. 7290-7292, 7304.] The Milwaukee and Menomonee Rivers also flow into the Milwaukee Harbor; therefore, discharges into these rivers from the overflow points on defendants' sewage system are also subject to whatever settling occurs in the rivers or the harbor. [Tr. 5174-5176.] Many of the overflow points, however, discharge into storm sewers or rivers that lead directly to the lake. Some settling may occur in sewers or rivers, but the sewage from South Shore, which is discharged directly into the lake, is, of course, not subject to these settling effects. As to those discharges that are subject to sedimentation in the harbor, and the rivers leading to the harbor, two points seem dispositive. First, plaintiff's introduced evidence [P.Exs. 147 and 148] showing fecal coliform counts at the harbor entrance, where the water flows into Lake Michigan, as high as 32,000 fecal coliform per 100 ml and 37,000 fecal coliform per 100 ml. These counts were taken using the membrane filter test, which may understate the fecal coliform count that would result from using the more sensitive multiple tube test ("most probable number" test) by factors of 10 or 100. [Tr. 3070-3073.]

Second, viruses and bacteria settle out if the particles in which they are embedded or to which they are adsorbed settle. [Tr. 2260, 10244-10245.] Pritchard stated generally that the "processes by which any living organism that drifts with the water ... can disappear" include sedimentation, and that such living organisms are "usually ... attached to other particles which have a density greater than water." [Tr. 7014-7015.] Nevertheless, on cross-examination, William Katz, Director of Planning and Development for the Milwaukee Metropolitan Sewerage District, testified that the specific gravity of fecal material is close to that of water, and therefore would be "one of the last things" to settle out. [Tr. 11400.] The trial court could properly have relied on Katz's testimony rather than Pritchard's, and found sedimentation of viruses and bacteria to be minimal in the harbor, rivers, or sewers.

Defendants also contend that along the path between Milwaukee and Illinois particles settle out taking their adsorbed

viruses and bacteria with them. But, as observed above, if the viruses and bacteria are embedded in or adsorbed to particles with densities less than that of water, sedimentation will be minimal. Since sedimentation in either the harbor or the lake will not kill or deactivate either viruses or bacteria, if they are resuspended by turbulence in the water or rapid currents in rivers or the lake, they may still be carried "live and intact" to Illinois water. [Tr. 10322-10323, 8861-8863.] Although the four to eight day life span of discharged bacteria makes resuspension and transport less significant as to them, viruses may live for months or indefinitely in cold water. Therefore, sedimentation of viruses may be of little, or no, practical significance.[5]

Defendants' argument that "biological inactivation" is not included in the die-off rates testified to by plaintiff's witnesses seems to be erroneous. In the first place, the coliform die-off rates presented in Canale, et al., "Water Quality Models for Total Coliform," 45 *Jl. W.P.C. Fed.* 325, 330-332 (1973), on which plaintiffs' expert Csanady relied [Tr. 2050], and which are cited in evidence presented by defendants [D. Ex. 85 at 73-74], are based on studies in which water from Lake Michigan was used. Any bacteria or algae present in Lake Michigan were also present in the samples; any "biological inactivation" that would take place in Lake Michigan would also occur in the samples. [See Tr. 2300-2301.] Moreover, it is unlikely that such biological inactivation" as may occur [Tr. 10226-10229] is significant. [Tr. 2297-2299.] Melnick testified that although "biological inactivation" may occur, it is much less significant than water temperature as a factor affecting the die-off rate. [Tr. 2297-2299.] Cliver who participated in the study described in Hermann, *et al.*, "Persistence of Enteroviruses in Lake Water," *Applied Microbiology* 895 (1974) [D.Ex. 38], testified that viruses injected into sterilized water from Lake Wingra in Madison, Wisconsin, lived longer than similar viruses injected into unsterilized lake water in a dialysis bag that was placed back into the lake. [Tr. 10227-10229.] Relying on that evidence

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[5] Any viruses or bacteria embedded in or adsorbed to organic material that does settle to the bottom may be eaten by macrobenthic organisms. See discussion of "predation", *infra.*

and data collected in an earlier study, Cliver and his colleagues suggested that proteolytic enzymes produced by bacteria and other organisms in Lake Wingra accelerate deactivation of some types of viruses. *See* "Persistence of Enteroviruses," *supra,* at 895 [D.Ex. 38.]. Assuming that bacteria or other organisms that produce proteolytic enzymes do exist in Lake Michigan, that fact does not substantially undermine the conclusion that the discharges at Milwaukee will affect Illinois. For as Cliver testified, notwithstanding any such "biological inactivation," deactivation of any viruses discharged into Lake Michigan in the winter could take months. [Tr. 10314, 10315.][6]

The third factor that defendants contend is not included in the die-off rates, but which affects the number of bacteria or viruses that would survive the trip from Milwaukee, is predation or grazing. Since bacteria or viruses are frequently adsorbed to organic material, if the organic material is ingested by organisms living in the lake, then the bacteria or viruses are also consumed. There is no doubt that organic material in the lake is consumed by the various living things in the lake. [E.g. Tr. 10086.] Defendants principally rely upon the testimony of Robert Otto, an aquatic biologist at Johns Hopkins University, and a report [D.Ex. 1321] prepared by him. Otto testified that macrobenthic organisms, which live on or in the bottom of the lake, "eat just about anything they can get their hands on that is on the bottom ...." [Tr. 10082; see Tr. 10084.] Otto further explained that:

> In some cases [the macrobenthic organisms] don't have the grinding capabilities to break down some kinds of organic material, but bacteria, of course, often have the ability to use these materials. If you ingest a particle which has a nice coat of bacteria, which are a live food source, these organisms can then digest the bacteria but not the particle, so they just clean the

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[6] The bacteria ordinarily found in sewage do not produce the proteolytic enzymes that accelerate deactivation of viruses. [Tr. 10326-10329.]

> particle off and send it back out to be recolonized by the bacteria.

[Tr. 10084-10085.] Otto does not refer to viruses but we assume they are subject to the same predation as bacteria. That macrobenthic organisms digest the bacteria on the outside of a particle is significant, but not dispositive, since we are also concerned about bacteria or viruses embedded in the solids. Furthermore, bacteria adsorbed to the outside of a particle will have been exposed to some chlorine even if it has been rendered less effective by combination with organic material in the effluent. Finally, to the extent that there are macrobenthic organisms that do have the "grinding capabilities or the digestive capabilities" to use the organic material, they only affect material that has settled to the bottom. As noted above, since fecal material has a specific gravity near that of water, much of it will remain suspended in the water column.

Otto also testified that there are three forms of zooplankton that swim in the water column, and that,

> Some forms eat phytoplankton [herbivorous]. Some forms are predatory in the sense that they eat other zooplankton [carnivorous]. Some types are omniverous in that they will eat other zooplankton if they can catch them. They will eat phytoplankton if they happen to run across them. They will eat particulate matter if that happens to come along.

[Tr. at 10086.] Only the omnivorous form of zooplankton eat particulate matter. Defendants asert that the report prepared by Otto [D.Ex. 1321] "indicates the abundance of the many predator grazing organisms in the lake." [Joint Memorandum at 40.] That document relates solely to macrobenthic organisms. There is no evidence that omnivorous zooplankton are present in Lake Michigan in any significant numbers. In fact Otto's testimony suggests exactly the opposite, for, in summarizing his testimony concerning the interrelationships of the organisms that live in the lake, he said, "In general zooplankton eat phytoplankton and macrobenthics eat just about anything they

can get their hands on that is on the bottom, and fish eat zooplankton and macrobenthics."[7] [Tr. 10081-10082.] Thus, it appears that although there are some omnivorous zooplankton, most of them are herbivorous. Moreover, zooplankton suspended in the water, would presumably be picked up in the water sample, in which case a die-off rate based on the observed die-off rate in a lake water sample would include some predation. In any event, based on the evidence presented, it appears that the most significant predation occurs with respect to viruses and bacteria that have settled to the bottom.

The fourth factor, ultraviolet radiation, is probably not accounted for in die-off rates based on laboratory observations. Although defendants concede that ultraviolet radiation is "not very significant," they argue that it should have been considered. Their witness Cliver testified that it would affect only a "very superficial layer of water" and would have no "significant effect on viruses within the water column." [Tr. 10311.] Plaintiffs' witness Melnick testified that ultraviolet radiation would deactivate viruses only in the top 1/10 of an inch of water and then only if they remained there for several minutes. [Tr. 2292.] We are not referred to any evidence that the effect on bacteria would be substantially different.

The district court's finding that pathogens discharged at Milwaukee are sometimes carried "live and intact" to Illinois waters is not clearly erroneous, even considering each of the assertedly independent factors urged by defendants.

C. Dillution and Distance from Shore

Even if pathogens live long enough to be transported from Milwaukee to Illinois and there are no other factors that would significantly reduce their numbers, dilution in the lake would reduce their concentration in a particular parcel of water. The district court found that although there was some dilution, it

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[7] Presumably, some fish might also eat organic material containing pathogens. Defendants do not, however, refer us to any evidence in the record on this point.

did not reduce the concentration of pathogens to insignificance. [Tr. 14217.] That conclusion is amply supported by the evidence presented at trial. Geldreich, it will be recalled, testified that a fecal coliform count of 1,000/100 ml indicates a high probability that pathogens would be present. *See* discussion of fecal coliform, *supra.* Defendant's witness Carter, using data found in the record,[8] including an initial fecal coliform concentration of 35,000/100 ml, calculated that the fecal coliform concentration of water at the Illinois border, not including any die-off, would be 4,014 fecal coliform per 100 ml. [Tr. 8924-8925.][9] Csanday, whose testimony on this point the court found credible [see Tr. 14216-14217], testified that if the current speed was 30 cm/sec., which Csanady testified was typical in Lake Michigan, dilution would have reduced the fecal coliform concentration in water beginning at Milwaukee by only 15% when it reached the Illinois boundary. [Tr. 2013-2014, 2054.] See *Diffusion and Dispersion, supra,* at 116-117 [P.Ex. 20]. Applying the *Canale* die-off rate, Csanady estimated that a fecal coliform concentration of 10,000 per 100 ml[10] would be reduced to 3,000 per 100 ml at the Illinois boundary, considering dilution and die-off. [Tr. 2053, 2054.] Defendants do not directly contest this point; rather they argue that in addition to dilution and die-off, the four "independent" factors already discussed should have been considered.

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[8] He used a diffusion velocity w = .33 [which was the average diffusion velocity found in the Pritchard-Carpenter study (P.Ex. 227) as estimated in D.Ex. 1164], a flow rate of 13,000 cubic feet per second [as indicated in D.Ex. 1164], a current speed of 1.19 feet per second [as indicated in D.Ex. 1164], a distance of 1.97×10^5 feet [as indicated in D.Ex. 1164], and an initial fecal coliform count of 35,000 per 100 ml [based on data in P.Ex. 148].

[9] Using the .58 die-off coefficient that defendants argued was proper [D.Ex. 1164], Carter calculated that the concentration at the Illinois line would have been 1,321 per 100 ml. [Tr. 8932-8933], well over the 1,000/100 ml indicator that Geldreich's testimony established.

[10] As stated in the text, *supra,* the fecal coliform counts for the raw sewage discharged from the overflow points on defendants' sewer system is sometimes much higher than 10,000/100 ml.

Whatever effect dilution may have, any viruses or bacteria that are in the water are reconcentrated to some extent on the water intake filters of drinking water treatment plants. [Tr. 13268-13269.] Generally reconcentration is not of great significance, but if there is a breakdown in the filtering system this high concentration of viruses will flow into the system and, if treatment is not adequate, into the drinking water supply. [*Id; see also* D.Ex. 34, p.4.]

Defendants contend that if bacteria and virus live long enough to be transported to Illinois waters and are not reduced to insignificance by dilution or other factors, they nevertheless remain too far from the shore to have any effect on Illinois water supplies or to be of any consequence to Illinois swimmers. Although the district court made no express finding on the distance from shore at which pathogens arriving in Illinois from Milwaukee will be found, the fact that the pathogens will be close enough to affect water supplies and swimmers is implicit in the court's finding that "[o]nce these pathogens arrive in Illinois waters, they can infect and cause disease in residents of Illinois ... in two ways: by ingestion of these waters at bathing beaches by swimmers and by ingestion of drinking water containing these pathogens." [Tr. 14221.] There is evidence sufficient to support the finding that pathogens arriving in Illinois waters from Milwaukee will be close enough to shore to affect Illinois residents.

Defendants contend that Csanady's testimony clearly shows that "pollutants, either conservative or nonconservative, which may have entered Lake Michigan at Milwaukee never get close enough to shore in Illinois to cause any hazard." [Joint Memorandum at 46.] Even the passage relied upon by defendants does not support the proposition. Csanady testified that although the center of a dye plume, used to simulate pollution movement, might be located several kilometers from shore,

> The concentration simply decreases from the center as you go shoreward .... The maximum occurs a certain distance from shore. But it doesn't decrease to zero.

[Tr. 2584.] In other words, lateral diffusion of the dye plume would result in some of the dye reaching the shore even though higher concentrations would be found further offshore. Defendants' witness Pritchard also testified that this would occur. [Tr. 6564.] Furthermore, in a passage not cited by the defendants, Csanady testified that a dye plume would move back and forth in an area extending from the shore to about 6 miles out in the lake. [Tr. 2586.] In response to the question of whether peak concentrations would ever move on shore, Csanady answered, "Yes, and there would be situations where the slug [or dye plume] meanders on shore and hits areas closer to shore." [Tr. 2025.] It seems fairly obvious that whether or not a dye plume or pollution will hit the shoreline depends in large part on wind direction. [See P.Ex. 222, 223, 224 (dye studies conducted at Milwaukee beaches in 1963).] Indeed, based on his study of pollution data from the Evanston-North Shore beaches and the associated wind directions, Geldreich testified: "It is quite obvious that there are occasions when the wind, when it is blowing from the northeast, is pushing pollution on those beaches." [Tr. 3111.]

Defendants also argue that upwelling and downwelling of the lake water operate to carry any pollution in the near shore areas out into the center of the lake in the manner described in the margin.[11] There are several factors that can cause upwelling or downwelling and at any particular time there may be more than

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[11] In winter, when throughout the depth of the lake the temperature is fairly uniform, the effect of upwelling and downwelling is less significant than in summer, when the temperature decreases with depth. In summer the upper layer of the lake, the epilimnion, and the bottom layer, the hypolimnion, are separated by an intermediate layer, the thermocline. Since heat from the sun warms the epilimnion and to a lesser degree the termocline, but has little effect on the hypolimnion, the temperature at the three levels varies. [Tr. 2071-2072.] Water is heaviest at 4 degrees Celsius (or 39 degrees Fahrenheit); at temperatures either above or below 4 degrees Celsius, water is lighter. The temperatures in the hypolimnion stay close to 4 degrees Celsius, and therefore the water generally remains at the bottom. [Tr. 2072.]

(Footnote continued on following page)

one contributing factor, but the most important appears to be wind. [E.g. Tr. 6498-6502.] If the wind blows from the west, surface waters on the western side of the lake move offshore and

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Footnote 11 (continued)

Water in the epilimnion generally remains on the top since it is warmer than 4 degrees Celsius and therefore lighter than the water at the bottom. As might be expected, in the intermediate layer or thermocline, the temperature increases rapidly from bottom to top. According to Csanady, "The physical effect of that rapid temperature change is to suppress the movement of parcels of the fluid." [Tr. 2072.] Consequently, the thermocline "becomes an effective floor for the mixing processes in the top of the lake ...." [*Id.*] Thus any pollution discharged in the winter which does not remain suspended near the top because of its specific gravity can mix with water all the way to the bottom. [Tr. 2022-2023.] But such pollution discharged in the summer after the thermocline has formed can only mix with the water down to the thermocline, reducing the dilution and increasing the concentration. [*Id.*]

Upwelling in the near-shore area would cause the surface waters to move toward the center of the lake. The near-shore surface water, having moved offshore, is replaced by deeper near-shore water, which is in turn replaced by deep offshore water. In winter since any pollution in the near-shore waters can mix to the bottom, the result is that polluted surface water near the shore will be replaced by deeper near-shore water, which may also be polluted to some extent and is in turn replaced by at least arguably cleaner offshore water, with the result that the pollution in the near-shore zone will be diluted.

Similarly, but perhaps more important, upwelling in the near-shore zone when the thermocline prevents mixing in the lower levels of water causes relatively clean water to replace the polluted surface waters that move offshore. The deep near-shore water is then replaced by cleaner deep offshore water. Upwelling in the summer causes the heavier water from the bottom to move to the top. When the force causing the upwelling stops, the heavier water sinks back to the bottom and is replaced by offshore warm surface water. [Tr. 6499-6501.]

For a detailed description of the upwelling/downwelling phenomenon see Mortimer, "Physical Characteristics of Lake Michigan and its Responses to Applied Forces," 2 *Environmental Status of the Lake Michigan Region* 35-43 (1975) [P.Ex. 20].

there is upwelling on the western shore and downwelling on the eastern shore; if the wind is from the east, then there is downwelling on the western shore and upwelling on the eastern shore. Nevertheless, the experts agree that whatever the wind direction the predominate current in the near shore area is shore parallel, either north or south. [Compare Tr. 6508, 6584 (Pritchard) with Tr. 1955-1956, 1947 (Csanady).] Indeed, the near-shore zone is sometimes defined as the area in which the predominate currents are shore parallel. [Tr. 6577; P.Ex. 38] Sato & Mortimer, *supra,* at 286 [Tr. 6577; D.Ex. 38].

Assuming that any upwelling on the western shore would clean out the near-shore waters, we cannot conclude that the pollution discharged at Milwaukee does not come close enough to shore to affect Illinois residents. At most, this evidence shows that discharges from Milwaukee would not build up over time in the near-shore waters. Moreover, as Pritchard's Ocean City, Maryland, experiments demonstrate, downwelling on the western shore will cause any pollutants in the near-shore zone to move toward the shore and sometimes all the way to the shore. [See Tr. 6565-6569.]

D. Danger to Illinois Residents

As noted above, the district court found that there were two ways in which pathogens discharged at Milwaukee can affect Illinois residents: "ingestion of these waters [containing pathogens] at bathing beaches by swimmers and by ingestion of drinking water containing these pathogens." [Tr. at 14221.] If there are viruses in the lake, swimmers may be infected. Melnick testified that "if they have minor cuts or abrasions on their skin, if they get water in their mouth or nose, they could pick up the virus and become infected." [Tr. at 2218.] It follows that if there are viruses in drinking water, the people drinking it may also be infected.

Two points should be noted concerning the hazards to swimmers. First, although any danger to swimmers exists only in summer when the lifespan of viruses and bacteria are shortest due to "warmer" water temperatures, the evidence discussed

above shows that even at 70 degrees Fahrenheit (21 degrees Celsius) viruses will survive for about two weeks [(Tr. 2199)] and bacteria will survive for at least 2 days [(Tr. 3092.)] Except in July and August, water temperatures in Lake Michigan seldom reach 70 degrees F;[12] at the lower temperatures more frequently found in Lake Michigan both viruses and bacteria will survive for longer time periods. [Tr. 2199, 3092.] Second, because of what was referred to at trial as the "coastal jet phenomenon", lake currents in summer are likely to be much more rapid than in winter, sometimes reaching speeds as high as 50 cm per second, which would carry effluent released at Jones Island to Illinois waters in less than two days. [Tr. 2009-2010; for an explanation of the coastal jet phenomenon *see* Tr. 2097-2098.] A current of 50 cm/sec would of course carry any effluent discharged at the South Shore plant to Illinois waters in even less time.

The district court found that viruses can and do get through drinking water treatment plants "both when the plant is being operated properly and even more so should the plant experience a breakdown." [Tr. 14222-14223.]

Organic matter in raw water from the lake may be concentrated on filters in water treatment plants, and when there is a breakdown or the filter fails to function the matter comes through. [Tr. 13269.] Viruses can be washed through with particulates when the filter is cleaned by flushing or pH is changed. [Tr. 13272.]

Viruses or bacteria in Lake Michigan can only affect Illinois drinking water supplies if they remain in the water after treatment. Tap water, after passing through a drinking water treatment plant, may contain particulate matter. [D. Ex. 34, p.4.] Wellings, although not an expert on drinking water treatment plants, testified that such particulate matter might contain

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[12] *See, e.g., Sato & Mortimer, supra,* [P.Ex. 38] at 64, 68, 72, 74, 78, 80, 82, 86, 88, 93, 94, 96, 100,102, 106, 110, 114, 118, 122, 124, 126, 130, 132, 138, 142, 144, 146, 150. [*See also* Tr. 10314-10315.]

viruses. [Tr. 13265.] In addition, Berg testified that "solid coloidal material" remaining in treated drinking water and referred to in two articles introduced by the defendants' [D. Exs. 3 and 34] as "turbidity" may contain viruses. [Tr. 12077, 12080-12082.] The testimony of Wellings and Berg indicates that viruses embedded in "particulate matter" [Tr. 13265-13266] or "solid coloidal matter" [Tr. 12080-12081] can survive the chlorination that occurs in water treatment plants. [Tr. 13265-13266 (Wellings as to particulate matter); Tr. 12080-12081 (Berg as to solid coloidal matter).] Although the evidence that a properly designed and operated water treatment plant will not provide adequate protection against pathogens in the raw water is less than compelling, it raised a debatable issue that the trial court was justified in resolving against defendants.

Moreover, the effectiveness of water treatment plants is not determined only by their optimal performance. Sometimes they do not operate at peak efficiency. Berg testified as follows:

> If a [drinking water] treatment plant breaks down at some point in time for some period of time, even for a very short period of time, during that period of time when there is perhaps inadequate removal of the solid material, when there is lack of chlorination, then any impact that raw water coming in may have by way of pathogenic agents, viruses or anything else, can presumably become a problem.
>
> Q Doctor, are you familiar with the public health principle articulated in the fields of microbiology and virology of a double tier protector?
>
> A. Yes. The multiple barrier
>
> ....
>
> A. (continuing) that we speak of, which means that you try to protect the raw water as much as you can so that in the event that something does happen at a treatment plant that you don't bring

> about an insult that can be carried through the plant and in this respect, carry through into the finished water pathogenic organisms or viruses.

[Tr. 12082-12083.] Melnick and Geldreich also testified that the possibilities of human error or mechanical breakdown make it imprudent to rely on water treatment plants to remove viruses from drinking water supplies. [Tr. 2191-2192 (Melnick); Tr. 3106-3107 (Geldreich); see Tr. 13267 (Wellings).]

The trial court's finding that viruses discharged into Lake Michigan at Milwaukee pose a hazard to Illinois drinking water supplies is therefore not clearly erroneous.

E. Accelerated Eutrophication

The district court found "that the defendants' sewage discharges into Lake Michigan are presently contributing in a substantial way to the accelerated eutrophication of the inshore zone of the western shore of Lake Michigan, including waters of Lake Michigan which are within the territorial boundaries of the State of Illinois." [Tr. 14242-14243.] Defendant's challenge to this finding is that the court did not quantify their contribution to accelerating eutrophication and that this was error because there are other contributors and defendants should not have been singled out. They do not question that they made the contribution, only its relative magnitude.

The significance of the court's eutrophication finding in relation to the issues to be decided is less than clear. As we explain below, the principal offending contaminant is phosphorus.[13] Defendant sewerage commissions acknowledge that "the trial court has merely enforced the defendants' discharge permit phosphorus requirements" (1 mg/l), but they then add,

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[13] Illinois asserts that sewage and effluent contain unspecified "other nutrients" that contribute to eutrophication. There were no findings made or relief granted with respect to these other nutrients, so we need not discuss them further.

"though different and costlier timetables are imposed." [Sewerage Commissions' Brief 28.] In our examination of the effluent limitations in the court's order and the discharge permits, undertaken without any guidance beyond the characterization quoted, we have been unable to discern any basis for that characterization. The permits' timetables for the phosphorus limitation seem to require compliance earlier than does the phosphorus limitation in the order. Thus the latter would, as a practical matter, appear to be academic. Nevertheless, because there is at least a theoretical possibility that the permit limitation will be relaxed, and also because the raw sewage discharges not covered by the permit contain phosphorus, we shall briefly examine the evidentiary basis for the eutrophication finding.

The term "eutrophication" refers to the gradual increase of nutrient concentration in a body of water, which results in increasing concentrations of phytoplankton and other living organisms. [Tr. 2822-2826.] The evolution of a body of water from oligotrophic (low nutrient concentrations) through mesotrophic (moderate nutrient concentrations) to eutrophic (high nutrient concentrations) is a natural process. See, *e.g.*, Sawyer, "Basic Concepts of Eutrophication," 38 *Jl. of W. P. C. Fed.* 737 (1966) [D.Ex. 1213]. Nevertheless, man's input of nutrients can drastically accelerate the process. See, *e.g.*, Sawyer, ABC's of Cultural Eutrophication and its Control: Wastewaters, Part 2," October *Water & Sewage Works* 322 (1971) [D.Ex. 1215]. Liminologists regard phosphorus as a "controlling element" in eutrophication [Tr. 2883-02884]. See, *e.g.*, Sawyer, "The Need for Nutrient Control", 40 *Jl. of W. P. C. F.* 363, 367-368 (1968) [D.Ex. 1214]; Sawyer, "ABC's of Cultural Eutrophication and its Control: Wastewaters, Part 2, *supra,* [D.Ex. 1215]. In other words, since phosphorus is necessary to support the growth of phytoplankton, limiting phosphorus inputs will impose an upper limit on the quantity of phytoplankton that a particular body of water can support. Sawyer, "ABC's", *supra;* Sawyer, "Nutrient Control", *supra* [D.Ex. 1214, 1215,] . Thus, although limiting phosphorus does reduce the nutrient concentration, the more important effect of such a limitation is that it

reduces the external manifestations of eutrophication. Phytoplankton and other organism resulting from eutrophication reduce the clarity of the water, cause objectionable smells, deplete the oxygen supply of the water, and may affect the quality of drinking water supplies. [Tr. 2826, 2924-2925.] Lake Michigan is experiencing accelerated eutrophication [Tr. 2883-2884], particularly near Milwaukee. *See* An Environmental Study of the Ecological Effects of the Thermal Discharges from Point Beach, Oak Creek, and Lakeside Power Plants on Lake Michigan, 10.0-49 to 10.0-50 (1974) [P.Ex. 2]. [Tr. 2879-2880; *compare* P.Ex. 144 at 20 and 72 *with* Tr. 2854.]

Determining what proportion of the total phosphorus discharges into Lake Michigan is contributed by Milwaukee seems hardly feasible and was in any event unnecessary. It is enough to support the limited relief granted with respect to phosphorus that Milwaukee's contribution was substantial.

II.

Evidence Relied on to Support 5 mg/l Limitations

The most specific evidence relied on by Illinois to support the 5 mg/l suspended solids effluent limitation imposed by the court is Wellings' testimony that similar solids limitations are used in St. Petersburg, Florida and that lower effluent solids content results in more effective disinfection:

> A. Our aim in St. Petersburg is to reduce solids to a 5, Jackson, JTU, Jackson Turbidity [U]nits, which is less than, I think probably 5 milligrams per liter of solids.
>
> Then that gives you the opportunity to have an effective chlorination. [Tr. 12397.]
>
> . . . .
>
> THE COURT. If you have say 5 milligrams per liter of solids, does that help the chlorine remove or

kill the viruses associated with those solids more than would be the case if you have 30 milligrams per liter?

THE WITNESS. Well, the problem with 30 milligrams per liter is you are going to have a lot of organics tied up with solids that is going to use up your chlorine, and the chlorine can't even get into.

THE COURT. I see. So the fewer solids, the less chlorine is used up in other ways.

THE WITNESS. That is right, and that is the reason if you get it down low enough you will have enough active chlorine that can really get to the solids. [Tr. 12398].

. . . .

Q. [Illinois' counsel] Doctor, whenever we are finding high solids -- well, is it your opinion that even at 30 milligrams per liter of solids that we have a problem with disinfection?

A. I think you would still have a problem with disinfection.

I really don't know how I would equate Jackson Turbidity Units with milligrams, you know, because you would have to know size, shape and all that, source, because of the test itself, but I would say 5 milligrams per liter would be well in the ball park.

. . . .

THE COURT. What do you mean by that phrase? Do you mean that would be what you would desire?

A. Well, I wouldn't want any more than that.

THE COURT. You would not want any more than that?

THE WITNESS. I would prefer much less, but I wouldn't want any more than 5.

Q. [Illinois' counsel]. So if we could perform at a maximum of 5 but consistently there would be ones and twos, would that be it?

A. Yes. [Tr. 12401-12402.]

To support the 5 mg/1 BOD_5 effluent limitations, as well as the solids limitation, plaintiffs rely on Geldreich's testimony that for most effective disinfection, BOD_5 and solids should be reduced as much as possible:

Q. [Illinois' counsel]. With respect to the question of BOD, which you have indicated interfered with the chlorination process, do you have any opinion as to how low we should get the BOD?

A. As low as possible.

Q. If you could achieve four milligrams per liter BOD through an advanced waste treatment facility, would that be desirable from the standpoint of chlorination?

A. Yes, sir.

Q. With respect to removal of solids, you indicated the solids problem being the encapsulation situation, with respect to effective disinfection through the use of chlorine, do you have any suggestion as to the level that you would want to have for solids?

A. Five milligrams per liter would be desirable.

Q. When you say five milligrams per liter, if that were achievable at an advanced waste treatment facility, would you approve of such a standard?

A. Yes, sir. [Tr. 3090-3091.]

Plaintiffs also rely on Berg's testimony that solids and organics interfere with chlorination:

> Q. [Illinois' counsel]. So, if we have got fecal material or any other materials surrounding the viruses and you put chlorine on it, will that kill it?
>
> A. The chlorine isn't going to penetrate very far. It is not going to kill embedded virus.
>
> Q. Would it be fair to say that in order to have effective chlorination of the material that you are chlorinating, you should remove the solids?
>
> A. That is correct.
>
> Q. With respect to the organics, do you also try and remove the organics?
>
> A. Yes. You would want to do that in order to prevent or reduce the formation of the compounds that are less effective. [Tr. 12068.]

Plaintiffs assert that Berg "testified that plant effluents of 50 or 100 mg/1 BOD or suspended solids ... would have no virus removal" [citing Tr. 12118-12120, Supplemental Memorandum of Plaintiff-Appellee State of Illinois 106]. The following passage from the transcript is cited in support of that assertion but does not appear to us to support it:

> Q. [Illinois' counsel]. If you were getting [residual chlorine measurements of] ... less than .1 by means of the orthotolidine method with respect to effluent from the standpoint of chlorination as a viricide, would you give an opinion as to the effectiveness of such chlorination as a viricide?
>
> .... [Objection overruled.]

> THE WITNESS. If we are talking about sewage effluent, the secondary effluent, from an activated sludge plant, that contains any substantial amount of ammonia as they usually do unless there is a special treatment to remove it, then all of that chlorine is going to be combined chlorine.
>
> Q. That would also assume, if you would assume, the presence of numbers of solids in the 50's or hundreds and the BOD in the 50's or hundreds?
>
> A. We have looked at some plants with levels like that.
>
> .... [Objection overruled.]
>
> A. ... We have looked at plants where we have seen chlorine levels, combined chlorine levels of 2, 3 parts per million, and we haven't been able to differentiate the amount of virus going in from the amount of virus going out. [Tr. 12117-12119.]

Residual chlorine content is related to solids and BOD_5 content, but Berg does not seem to have been saying that 50 or 100 mg/liter suspended solids or BOD_5 would result in "no virus removal." Indeed, Berg pointed out that the effectiveness of chlorine as a viricide, whatever the solids or BOD_5 content of the effluent, will vary depending upon the manner in which chlorine is introduced into the effluent. [Tr. 12119-12120.]

Plaintiffs also rely on Gordon Culp's testimony, suggesting that the kind of treatment necessary to meet the effluent limitations imposed by the district court is preferable to the kind of treatment now used by the defendants:

> Q. [Illinois' counsel]. When you talk about coagulation and settling combined with filtration, you get a very stable, very uniform, very low concentration of contaminants in the effluent, is that right?

A That is right. It is very consistent. You are no longer dependent on the gravity separation, only of a very light flocculent biologic material, biologic material which can vary in its settling capabilities from day to day. Now you have very positive control with the solids.

Q. Let me just ask this. You were a trained engineer dealing with an activated sludge plant -- were you very conscientious about its performance?

A. Yes.

...

Q. Now, despite your trained engineering supervision of that plant, were you able to get a consistently low solid and BOD out of the activated sludge plant?

A. No.

Q. Are the upsets in an activated sludge plant something that you can predict? Can you sit back and say "We are going to have a bad day tomorrow?"

A. No, you certainly cannot. There are some conditions, of course, which will occur which will allow you to predict that, but the normal operation, no.

[Tr. 13006-13007.] Finally, plaintiffs note that one of the defendants' consultant sanitary engineers recommended treatment similar to that required to meet the effluent limitations imposed by the court, that three cities have been required to meet similar effluent limitations, and that several other cities have decided to make additions to their own treatment facilities similar to those that will be required under the court's order.

The reasons supporting our finding that this evidence is insufficient to support the 5 mg/l BOD_5 and suspended solids limitations are stated in our published opinion and need not be repeated here.

UNITED STATES COURT OF APPEALS

For the Seventh Circuit
Chicago, Illinois 60604

June 14, 1979

Before
Hon. THOMAS E. FAIRCHILD, Chief Judge
Hon. PHILIP W. TONE, Circuit Judge
Hon. ROY W. HARPER, Senior District Judge*

PEOPLE OF THE STATE OF ILLINOIS,
Plaintiff-Appellee,

and

PEOPLE OF THE STATE OF MICHIGAN,
Intervening Plaintiff-Appellee,

No. 77-2246 vs.

CITY OF MILWAUKEE, THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,
Defendant-Appellants.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division

No. 72-C-1253

John F. Grady,
Judge.

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* The Honorable Roy W. Harper, Senior District Judge of the United States District Court for the Eastern and Western Districts of Missouri, is sitting by designation.

O R D E R

On consideration of the petition for rehearing and suggestion for rehearing in banc filed in the above-entitled cause by counsel for the plaintiff-appellee, no judge in regular active service having requested a vote on the suggestion for rehearing in banc, and all members of the original panel having voted to deny a rehearing,

IT IS ORDERED that the aforesaid petition for rehearing be, and the same is hereby, DENIED.

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

PEOPLE OF THE STATE OF ILLINOIS, ex rel., WILLIAM J. SCOTT, Attorney General of the State of Illinois,	)	
Plaintiff,	)	
PEOPLE OF THE STATE OF MICHIGAN,	)	
v.	)	Case No. 72-C-1253
CITY OF MILWAUKEE, WISCONSIN; CITY OF KENOSHA, WISCONSIN; CITY OF RACINE, WISCONSIN; CITY OF SOUTH MILWAUKEE, WISCONSIN; THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,	)	
Defendants.	)	

JUDGMENT ORDER

This cause having come on trial before this Court, and the Court having heard the witnesses and having examined the exhibits admitted into evidence, and the Court having heard the legal arguments for the parties, and the Court, on July 29, 1977, from the bench having announced its "FINDINGS OF FACT AND CONCLUSIONS OF LAW."

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED that the defendants CITY OF MILWAUKEE, SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE AND THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY MILWAUKEE and each of them and their agents, employees or successors in interest are hereby permanently enjoined from emitting sewage discharges, from the respective sewer pipes or structures owned or maintained by the defendants, into Lake Michigan or any of its tributary waters, except as hereinafter permitted in this order and said defendants are hereby ordered to:

(1) The respective defendants shall in their respective jurisdictions eliminate all sewage overflows emanating from sewer pipes or structures owned, operated or maintained by the defendants located outside of the area which was designated by the defendants at trial as the Combined Sewer System Area hereinafter ("CSO"). Elimination of such overflows shall be completed on or before July 1, 1986. For purposes of this order, an overflow is defined as a crossover, bypass, diversion structure, relief structure, pump station or any other device or mechanism by which human fecal waste is discharged directly or indirectly to public streams, rivers or lakes without collection and treatment according to the treatment methods and effluent limits set forth in paragraph (3) below. If, in defendants' opinion, completion by such date becomes impossible due to circumstances beyond defendants' control, then defendant(s) may apply to the Court for an extension of time for completion. Any such application, if opposed by either plaintiff, must be predicated on an evidentiary hearing preceeded by adequate opportunity for discovery by plaintiffs. Defendant shall be required to prove the basis for and the necessity for such extension which extension shall be granted or denied in the sound discretion of the Court. Defendants shall pay plaintiff(s)' entire costs of any such

application including reasonable attorneys' and experts' fees, and the costs of discovery, preparation and presentation of their position.

(2) The Commission defendants shall in three stages, the first to be completed on or before December 31, 1985; the second on or before December 31, 1987; and the third on or before December 31, 1989, put into operation a collection, and conveyance system in the combined sewer system area ("CSO") which shall collect and convey all human fecal waste entering the sewers in the combined sewer system area. The first stage of such system shall have storage capacity of not less than 700 acre feet, the second not less than an additional 1290 acre feet, and at the completion of the third stage (December 31, 1989) the entire system shall have storage capacity of not less than 2605 acre feet and shall be designed and operated within such storage capacity so as to collect, convey and store the volume of flow and all human fecal waste capable of transmission by the combined sewer system. Defendants have analyzed rainfall events experienced during the period 1940 through the date hereof (which is the period for which detailed hourly rainfall data is available) and have represented to this Court that their analysis demonstrates that at a storage capacity of 2605 acre feet, there would have been no overflows from such a system. All fecal wastes and flows collected and conveyed from the combined sewer area shall be treated according to the treatment methods and to the effluent limits set forth in paragraph (3) below.

Overflows, if any, which do occur shall constitute a violation of this order unless defendants can prove as a defense to a charge of violation either:

(1) that the overflow resulted from runoff conditions which exceeded the capacity of the 2605 acre

feet of storage at a pump out rate to advanced treatment of 110 CFS; and that the runoff events which resulted in the overflow would have caused an overflow in excess of the design capacity of the 2605 acre feet storage system at 110 CFS under the identical scientific premises and calculations used by the defendants prior to the date of this order to design the size of such storage system; or in the case of overflows resulting from causes other than excess runoff events,

(2) that the overflow was wholly caused by actions or occurrences wholly outside the control of the defendants and was in no way caused or contributed to by the negligence of the defendants.

Any defense to an overflow violation shall be predicated on an evidentiary hearing preceded by an adequate opportunity for discovery by plaintiffs. Defendants shall bear the evidentiary burden of proof of establishing the defenses listed above, and if the Court finds that the defense has not been proven, shall pay plaintiff(s)' entire costs of opposing any such defense including reasonable attorneys' and experts' fees and the costs of discovery, preparation, and presentation of plaintiffs' position. In any event, any overflows which may conceivably occur shall be subjected to treatment by bar screens, followed by drum screens, followed by chlorination prior to discharge. Should defendants develop information which establishes in defendants' opinion that separation of all or part of the system is a preferred alternative, which will provide a collection and treatment level equal to or better than that required herein then defendants may apply to the Court for modification of this paragraph to provide therefor. Any such modification, if opposed by either plaintiff, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plaintiffs. Defendants shall bear the evidentiary burden of proof of establishing that such modification equals or exceeds the level of protection provided herein. Defendants shall pay plaintiff(s)' entire costs of any such application including reasonable attorneys' and experts' fees, and the costs of discovery, preparation and presentation of their position.

(3) The Commission defendants or their successors in interest shall from and after December 31, 1985 treat all human fecal wastes which reach existing, expanded, or newly constructed treatment plants owned, operated or maintained by the defendants by means of appropriate secondary treatment facilities to be followed by treatment with chemical coagulation, sedimentation, and sand or multi-media filtration which facilities shall as of December 31, 1986 and thereafter produce an effluent which does not exceed five (5) milligrams per liter (mg/l) suspended solids and five (5) milligrams per liter of five (5)-day carbonaceous biochemical oxygen demand (BOD_5). From and after December 31, 1986, there shall be no by-pass at any existing, expanded or newly constructed treatment plant. The effluent requirements shall be calculated on the basis of daily composite samples averaged on a 30 day consecutive basis, provided that the maximum effluent concentration discharged on any given day shall not exceed ten (10) milligrams per liter suspended solids and ten (10) milligrams per liter carbonaceous BOD_5. The effluent shall be treated with chlorine, so as to achieve a free chlorine residual as measured by the amperometric test after 15 minutes residence time. If defendants conclude that some other disinfectant chemical or procedure will provide a level of protection equivalent to such chlorine treatment and is preferable, defendants may apply to the Court for a modification of this paragraph (3) to permit the use of such other disinfectant chemical or procedure. Any such modification, if opposed by either plaintiff, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plaintiffs. Defendants shall bear the evidentiary burden of proof of establishing that the proposed modification will provide a level of protection equivalent to such chlorine treatment.

Maximum fecal coliform counts on any one grab sample shall not exceed 40 fecal coliform per one hundred (100) milliliters. Phosphorous (P) concentrations shall be no more than one (1) miligram per liter based on a monthly average.

(4) Plaintiffs have emphasized their concern to maintain a detailed understanding of defendants' progress in designing and constructing the facilities ordered by the Court. Defendants have agreed to and shall allow plaintiffs, during working hours and upon reasonable notice, to conduct a continuing engineering audit of defendants' progress in complying with this order and have agreed to permit plaintiffs (and persons designated by plaintiffs) complete access to all planning, testing, design and construction or operational work or materials prepared by defendants or their consultants. Defendants have also agreed to and shall promptly pay the reasonable charges or fees of persons designated by plaintiffs to conduct such continuing engineering audit provided that such engineering audit activities to be paid by defendants shall not exceed 50 man days per calendar year; and any of such required payments accrued or made during the course of appeal shall be and remain the obligation of defendants regardless of the outcome of any appeal.

(5) During the periods necessary to complete the facilities required for compliance with the provisions of this order, as set forth above, the defendants shall be permitted, on the basis of using the best engineering practices available within the limits of the capabilities of those facilities, to continue the operations of their respective sewage collection, treatment and discharge facilities as the same may be modified from time to time to comply with the requirements of this order. Existing disinfectant systems shall be maintained and operated in such periods and no new by-passes or overflows shall be installed or operated during such periods except that prior to December 31,

1986 *and not thereafter* a by-pass may be installed and operated if required as a protective device to protect the South Shore Plant and then only if triggered at and operated during the existence of a flow rate equal to or greater than the plant flow capacity (260 to 316 mgd) for flow in excess of such capacity. In the event that plaintiff(s) challenge any overflow as being in violation of the provisions of this order for the reason that such overflow was not triggered by and limited to flows in excess of plant capacity, it shall be the burden of the defendants to prove in an evidentiary hearing preceded by adequate discovery by plaintiff(s) that such overflow was triggered by and limited to flows in excess of plant capacity. If the Court finds that the defense has not been proven, defendant(s) shall pay plaintiff(s)' entire costs of opposing any such defense including reasonable attorneys' and experts' fees and the costs of discovery, preparation, and presentation of plaintiffs' position.

As set forth in paragraph (3) above, all by-passes shall be eliminated by December 31, 1986. If one or more additional temporary overflows become necessary in defendants' opinion in the defendant City of Milwaukee's system for operation to protect the public health prior to December 31, 1986, then defendants may apply to the Court for a modification of this paragraph 6 to permit operation of such additional overflows up to but not after December 31, 1986. All such overflows shall be eliminated by December 31, 1986. Any such modification, if opposed by plaintiffs, must be predicated on an evidentiary hearing preceded by adequate opportunity for discovery by plaintiff(s). Defendants shall bear the evidentiary burden of proof establishing the public health requirements for such modification which shall be founded in such public health requirements as, but not limited only to, preventing the backing-up of sewage in basements. Defendants shall pay plaintiff(s)' entire costs of any such application including reasonable attorneys' and experts' fees and the costs of discovery, preparation and presentation of their position. Nothing herein shall

relieve defendants or any of them from compliance with other applicable discharge standards.

(6) As a joint and several responsibility, defendants shall pay immediately to plaintiffs the amount of $230,000.00, in the manner directed by plaintiffs, as costs of these proceedings, in lieu of following normal procedures to tax costs by the Clerk of this Court. Such sum in total shall be returned to defendants in the event judgment is reversed in toto; in no event shall defendants question the individual items or dollar amounts within such total.

(7) All burdens of proof set forth as requirements of this Judgment Order shall be met by a standard of a preponderance of the evidence.

(8) The Court hereby approves and orders the defendants to adhere to the schedules set forth in Exhibits 1 and 2 attached hereto for compliance with this Judgment Order. If defendants apply to the Court for modification of any component of the time schedules herein, such modification, if opposed by plaintiffs or either of them, must be predicated on an evidentiary hearing preceeded by adequate opportunity for discovery by plaintiffs. Defendants shall bear the burden of proof that such modification is required by causes wholly outside the control of the defendants or their agents, consultants or employees, and was in no way caused or contributed to by the negligence of the defendants or their agents, consultants or employees. The granting or denial of any such application shall be in the sound discretion of the Court.

(9) The Court hereby expressly reserves jurisdiction over the parties hereto and over the subject matter hereof to enforce the provisions of this Judgment Order.

Entered: November 15, 1977

/s/ JOHN F. GRADY
United States District Judge

EXHIBIT 1
MMSD FACILITY PLANNING SCHEDULE

1.1.7.2

11 NOV., 1977

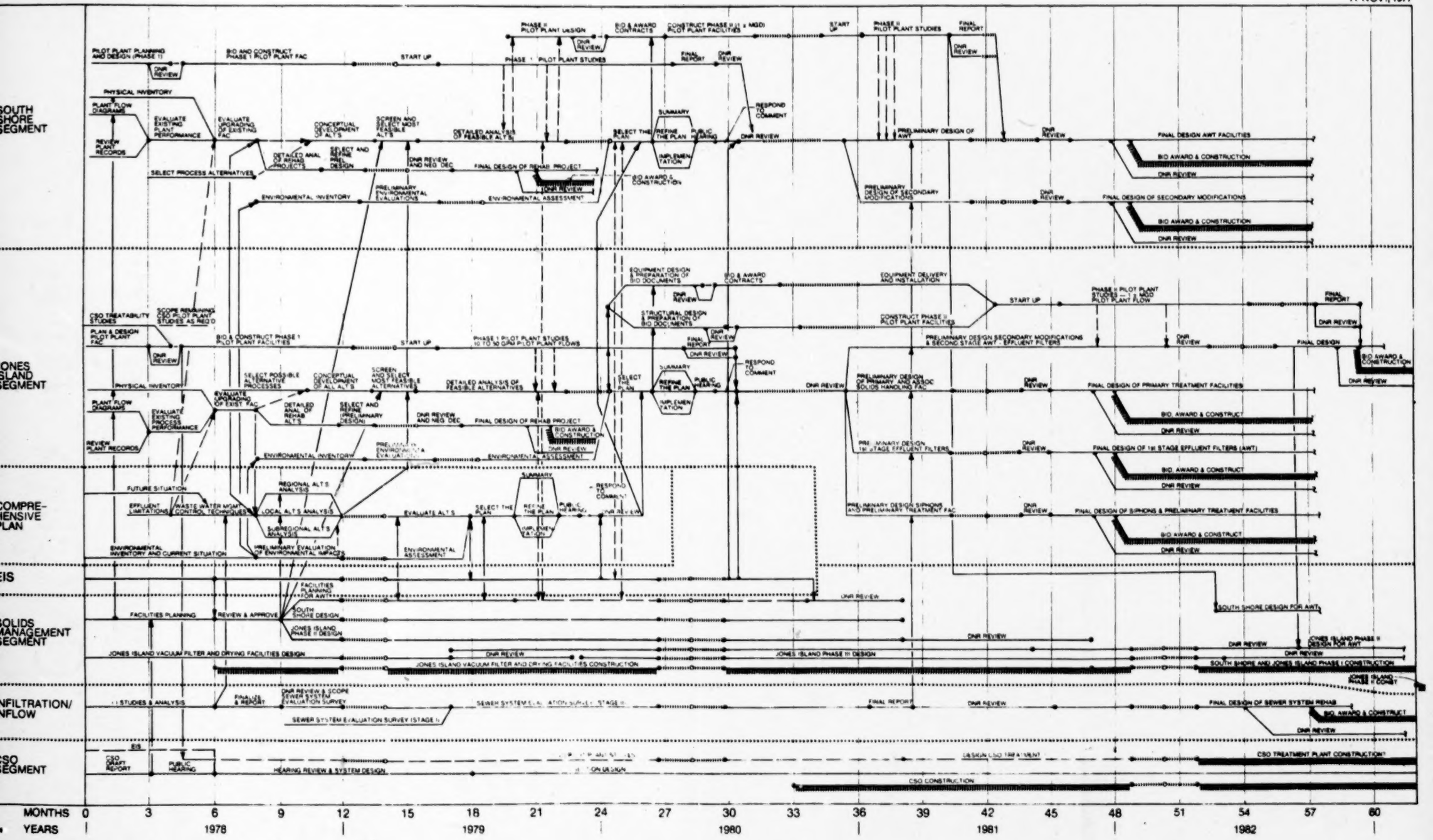
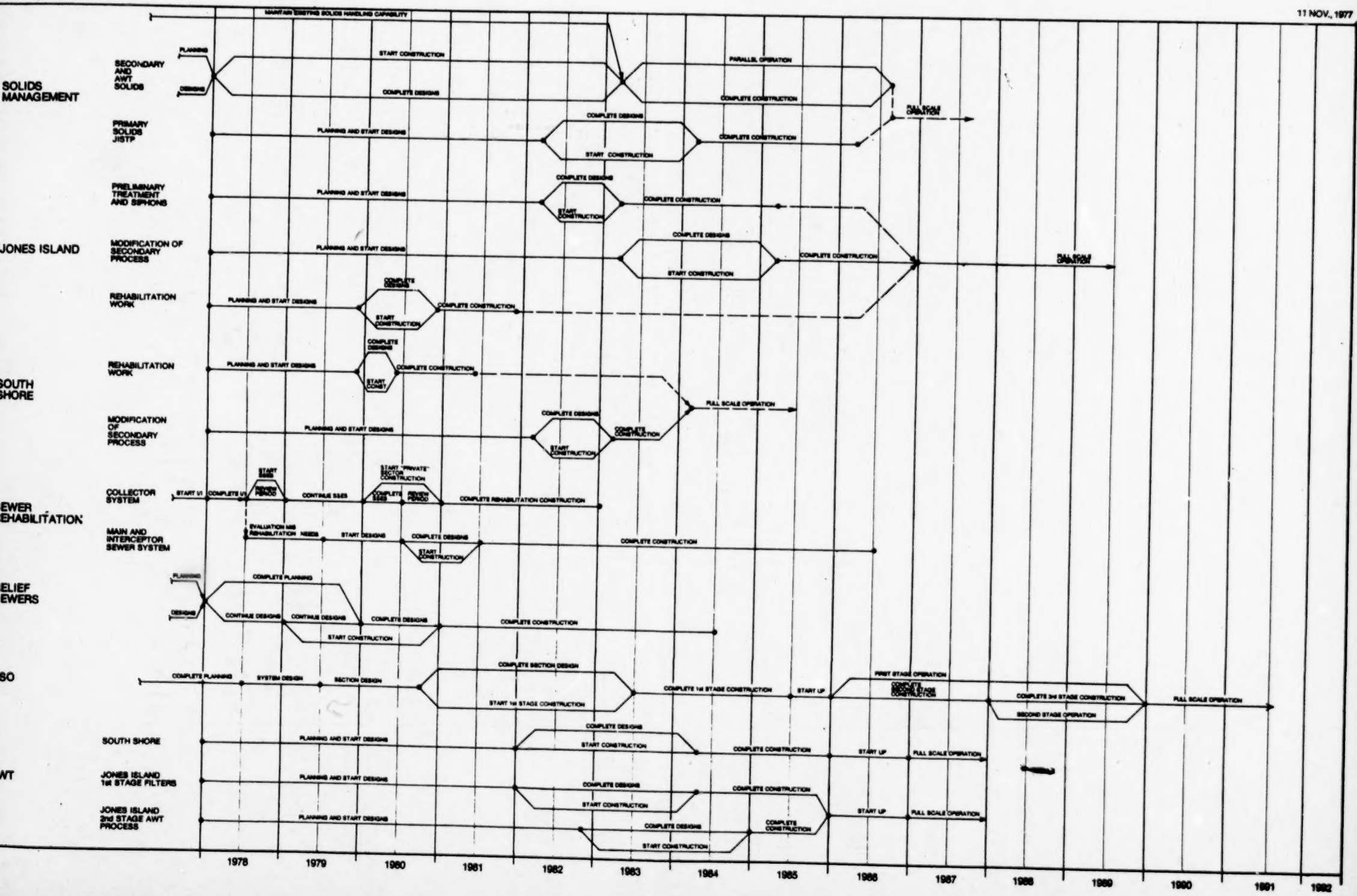


EXHIBIT 2
MMSD PROGRAM SCHEDULE 1.1.7.2



UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

PEOPLE OF THE STATE OF ILLINOIS, ex rel., WILLIAM J. SCOTT, Attorney General of the State of Illinois,	)	
Plaintiff,	)	
PEOPLE OF THE STATE OF MICHIGAN,	)	
v.	)	Case No. 72-C-1253
CITY OF MILWAUKEE, WISCONSIN; CITY OF KENOSHA, WISCONSIN; CITY OF RACINE, WISCONSIN; CITY OF SOUTH MILWAUKEE, WISCONSIN; THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE, and THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE,	)	
Defendants.	)	

STIPULATION

It is hereby stipulated by and between the parties hereto that the relief necessary to achieve the effluent quality required by the decisions of this court heretofore rendered herein is set forth in the proposed Judgment Order, copy of which is attached.

This stipulation is entered into for the purpose of presenting to the court the specific engineering solutions, with scheduling and effluent standards, required to carry out the general Findings and Conclusions and the general requirements which this court has imposed on the defendants herein in such decisions. Its submission is made to avoid the necessity of adducing extensive expert testimony before the court directed to the same purpose.

The parties agree to be precluded from asserting on appeal any challenge to the engineering feasibility (or to the engineering feasibility of the time schedules for installation) of the transport, collection and treatment facilities and the engineering feasibility of accomplishing the effluent standards set forth in the attached form of Judgment Order.

The parties also agree to be precluded from asserting on appeal any challenge to the engineering audit charges set forth in paragraph (5) of the attached form of Judgment Order and to be precluded from asserting on appeal any challenge to the payments of the trial costs set forth in paragraph (7) of the attached form of Judgment Order. The trial costs set forth in paragraph (7) shall be returned to defendants if Judgment is reversed in toto. The parties also agree to be precluded from asserting on appeal any challenge to the evidentiary burdens and future cost payments imposed by the attached order.

Other than as set out above, this stipulation is entered into without prejudice to the rights of any of the defendants to appeal from the ultimate judgment entered herein upon any and all grounds including without limitation: challenges to the jurisdiction of the court; assignments of error in the determinations of liability and of each and every element thereof; assertions that error has been committed in establishing the various levels of relief in the prior decisions herein; assertions that the findings are not supported by the evidence; and, assertions that the conclusions are not supported by the findings or the evidence.

Upon the foregoing understandings, agreements and stipulations it is further stipulated that a Judgment Order in the form attached may be entered upon motion of any party without further notice than this stipulation, it being expressly understood that defendants hereby agree to make the payments required by said proposed Judgment Order in accordance with the terms thereof when and if such proposed Judgment Order is entered by the court.

Nothing in this stipulation precludes any party from appealing the results of any future evidentiary hearing provided for in the attached Judgment Order on any grounds which are then appealable.

Date: November 14, 1977

PEOPLE OF THE STATE OF ILLINOIS ex. rel.,
WILLIAM J. SCOTT, Attorney General of the
State of Illinois,
by: /s/ WILLIAM J. SCOTT
Its Attorney

PEOPLE OF THE STATE OF MICHIGAN
by: /s/ THOMAS J. EMERY
Its Attorney

CITY OF MILWAUKEE, WISCONSIN
by: /s/ MICHAEL J. McCABE
Its Attorney

THE SEWERAGE COMMISSION OF THE CITY OF MILWAUKEE
by: /s/ RICHARD W. CUTLER
Its Attorney

THE METROPOLITAN SEWERAGE COMMISSION OF THE COUNTY OF MILWAUKEE
by: /s/ RICHARD W. CUTLER
Its Attorney

PEOPLE OF THE STATE OF ILLINOIS, etc., et al.,	)	
Plaintiffs,	)	
vs.	)	No. 72 C 1253
CITY OF MILWAUKEE, etc., et al.,	)	
Defendants.	)	

BEFORE: The Honorable JOHN F. GRADY, Judge.

Friday, July 29, 1977

10:00 a.m.

Parties met pursuant to adjournment.
PRESENT:

MR. KARAGANIS
MR. GAIL
MR. EMERY
MR. SCOTT

MR. MOERKE
MR. MOAKE
MR. MC CABE
MR. H. PITTS
MR. MELIN

THE CLERK: 72 C 1253, People of the State of Illinois, ex rel. William J. Scott, Attorney General of the State of Illinois, et al., v. The City of Milwaukee, Wisconsin, et al.

THE COURT: Good morning.

MR. MOERKE: Good morning.

MR. MC CABE: Good morning.

MR. KARAGANIS: Good morning, your Honor.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

THE COURT: I would like to make some preliminary observations on two points of law which are pertinent to the way the court looks at the facts of the case.

I believe that I have jurisdiction to try all three causes of action that are asserted in the complaint. The United States Supreme Court in the case of *Illinois v. Milwaukee,* 406 U.S. 91 (1972), indicated that this is a case to be tried under the federal common law of nuisance, but it did not indicate that pendent jurisdiction to try the state claims would be inappropriate. I have concluded that the case should be decided under the principles of the federal common law of nuisance, but I further believe that the elements required under that cause of action are also the same elements which the court would have to find under the two state claims. Therefore, in my view, it makes no practical difference that the Court is taking the case on all three counts.

The second legal question of preliminary significance is the matter of the burden of proof. What is the standard to be applied? There are the cases which indicate that in controversies between sovereign states, principles of comity require clear and convincing evidence before the right of any state is circumscribed at the instance of another state. And the Supreme Court did not indicate in the case of *Illinois v. Milwaukee* that this was not a case between states. Indeed, by saying that it did have original jurisdiction to try the case concurrent with the jurisdiction of the district court it seems to me that the Supreme Court implied that this is a suit involving different states. Yet the Court did not say that expressly.

I do not believe that it is a suit between states. It would seem to me anomalous to say that the municipalities and agencies that are involved as defendants in this case are the same as

the State of Wisconsin when the fact is that the State of Wisconsin has sued these same municipalities and agencies about subject matter closely related to the subject matter before me. The State of Wisconsin has sued these defendants about the matter of sewage disposal. If the proposition that one cannot sue oneself is as self-evident to you as it is to me, you may agree with me that the State of Wisconsin, at least for purposes of this case, is not the same as the defendants.

I believe that the preponderance of the evidence is probably the standard of proof that is appropriate for this case. Here again, however, due to the way I view the evidence, there is no practical difference in the result I reach, regardless of which standard of proof I employ.

Turning now to the facts of the case, I note that some of the salient ones are not disputed between the parties. For instance, it is not disputed that parcels of water from the Milwaukee area do travel past the state line to the south and do transport materials from the Milwaukee area to the State of Illinois. As another example of an important fact that is not in dispute, the defendants and the plaintiffs agree that sewage overflows and discharges of raw sewage into the lake are undesirable.

There are more facts, however, that are in dispute than are agreed upon, and the nature of the factual dispute is such that I have found it necessary to rely upon expert witnesses to a far greater degree than is normally required in an ordinary lawsuit and even in the typical suit involving matters of science and technology.

Ordinarily, when the trier of fact weighs evidence and attempts to come to factual conclusions, he does so in the light of his own experience and his own observations and his own common sense. Not only is this proper to do, it is something that we specifically instruct juries to do in every jury case.

The nature of the subject matter here, however, is such that my own experience and observations in life are of relatively little

use to me. It is well known to all of us that the arcane subject matter of some of the expert testimony in this case was sometimes over the heads of all of us to one height or another. I would be certainly less than candid if I did not acknowledge that my grasp of some of the testimony was less complete than I would like it to be, but short of enrolling in a university course directed toward a reorientation of my entire education and spending the years that that would involve, I know of no remedy for the problem.

What I have had to do, though, because of the problem, is to rely to a very large extent upon expert witnesses whose credibility impressed me favorably. Both sides have produced in this case expert witnesses whose credentials were impressive, if not overwhelming. Very little effort has been spared by either side to present witnesses who were knowledgeable in the numerous areas of science and technology that are involved in this case.

I think all of these witnesses are interested in the outcome of this case. None of them is neutral as between the parties in this case or as to the hoped for outcome of the case. This is not surprising. These people devote their lives to a study of the questions which confront us here. In doing that, they necessarily come to conclusions and reach points of view and become members of schools of thought on subjects pertinent to this inquiry. That, standing alone, does not make the witness biased in any invidious sense. I have found some witnesses in this case who, despite their obvious commitment to particular points of view, were in my opinion honest, forthright, reasonably objective and who, in my opinion, made a genuine effort to be helpful to me in the resolution of these difficult problems.

I am going to make some comments about some of the witnesses during the course of my remarks today because I believe it will be helpful to the parties in understanding the basis for my decision, and helpful to the reviewing courts in passing upon the validity of the decision I make, to know what I thought of the witnesses. I have re-read some of the testimony since I saw you last. I thought about someone approaching that

task for the first time, without having seen the witnesses, observed their demeanor, seen the interaction between the witnesses and counsel, the interaction between the witnesses and the court, and sometimes even the interaction of the witnesses between themselves in the courtroom. Without the benefit of all those observations, it seems to me that it will be a very difficult task for a newcomer to the case to have the kind of grasp he would like of the probable credibility of the various witnesses. And, therefore, to assist anyone who does read this record, at least to the extent of letting him know what I thought, I am going to make some observations; and I do it for that reason only and not to be unkind or to denigrate anyone unnecessarily.

There were four witnesses in the case who I thought were outstanding. They were outstanding in the sense that they were the best of a number of good witnesses. These were the witnesses Geldreich, Tierney, Wellings and Culp. There was another group of witnesses I felt as almost equally helpful to the court and of very high caliber, both in terms of their competence and in terms of their credibility. Those were the witnesses Carter, Cliver, Katz, Berg, and Mack.

The limnologists were in a class by themselves. It was perhaps accidental but nonetheless significant that they were even treated as a separate class in that they were permitted to sit through the testimony of other witnesses. The limnological testimony was the least conclusive, the least satisfying, the least convincing of any of the testimony in the case. This is no reflection upon the witnesses who gave it but rather a statement describing the state of the art. What we do not know about what goes on in Lake Michigan far exceeds what we do know, and all of these persons readily acknowledged that. The limnologist whom I found most helpful, and upon whom I rely with the greatest feeling of comfort is Dr. Schelske.

There were some witnesses I felt were biased in the undesirable connotations of that term. These witnesses were biased either because they have a personal commitment to one of the parties in the case or because of their devotion to a particular point of view. Some of these witnesses were combative

and unwilling to concede points on cross examination which they should have conceded because they were so obvious. They were on occasion evasive and doctrinaire. These were the witnesses Verber, Zanoni, Pritchard, Fitzgerald, Sproul and Gupta.

The case breaks down into two principal subject matter areas. The first is the matter of public health, and I will address myself to that now.

The defendants in this case discharge disease-causing bacteria and viruses to Lake Michigan in two ways. First is the raw sewage which is discharged to Lake Michigan during wet weather periods through devices known as overflows, by-passes and cross-overs from the sanitary sewer system to the storm sewer system.

The second way in which these pathogens are discharged to the lake is in the form of insufficiently treated sewage effluent discharged from the two sewage treatment plants owned and operated by the defendants. The pathogens are in the effluent for several reasons. One reason is that the treatment time is often insufficient, due to overloading of the plants, and there is not sufficient time to settle out the solids in the sewage. These solids interfere with chlorination, so that the chlorine does not reach the pathogens. Even when the plant is not overloaded many of the solids still fail to settle out.

The defendants attempt to conform their effluent to a standard of 30 parts per million of suspended solids and BOD, but they rarely achieve that standard and concede that before they can meet it with any consistency a substantial amount of additional plant renovation and updating will have to be done; but even if a 30/30 standard were met, it is my finding that that standard would still result in the discharge of staggering numbers of pathogens to Lake Michigan.

These pathogens, once they are discharged to the lake, are on occasion transported by the currents to the waters of the State of Illinois. We know this for several reasons. First of all,

both sides concede that on a number of occasions throughout the year, there are currents of sufficient persistence in a southerly direction and of a sufficient speed to transport from the Milwaukee area pathogens which will still be alive when they reach the Illinois state line.

The bacteria live on the order of four to eight days in the water, and there is a phenomenon known as regrowth, which can result in a substantial replacement of bacteria which die by the birth of new bacteria occurring during the southward flow. Viruses, which I regard as the more serious of the two principal types of pathogens with which we are concerned, live for a week and a half or two weeks in warm water and can live for months in colder water.

There is no doubt that viruses and bacteria have a long enough life span to reach Illinois in the persistent currents which occur a number of times a year. How many times a year this occurs is, of course, impossible to state with any certainty. The plaintiffs' experts estimate something like a dozen times a year. The defendants' experts estimate that it is more like four times a year or possibly even two times a year. But both sides concede that their estimates could be off either on the high side or on the low side.

In addition to the die-off of the pathogens themselves, there is another factor which ameliorates the problem to some extent, and that is the phenomenon of dilution. The water which comes down in a parcel doesn't come down intact in the exact form that it left Milwaukee Harbor. Rather, it dilutes with the other water in the lake.

The experts are in conflict as to the amount of dilution and even as to the proper scientific principle to be applied to determine the amount of dilution. Notwithstanding that dispute — which I resolve in favor of the plaintiffs on the basis of what I perceive to be the greater credibility of their witnesses on the subject — there still is not sufficient dilution to eliminate the viruses and the bacteria from the water which we know arrives in Illinois from Milwaukee on some occasions during the course

of the year. There is no reason not to believe that bacteria and viruses numbering literally in the millions are transported live and intact from Milwaukee to Illinois waters.

The defendants produced a considerable amount of testimony designed to show that the matters of which I have just spoken do not in fact occur or at least do not occur on a scale sufficient to constitute a health hazard to the residents of Illinois. An organization known as Envirex conducted certain studies designed to show that the sewage, when it comes out of the Milwaukee River and when it comes out of the treatment plants, is almost immediately diluted to a degree that only insignificant numbers of pathogens and insignificant amounts of other pollutants could reach Illinois waters, if any could reach Illinois waters at all. These were known as the net studies and the shore studies conducted by Envirex.

I attach almost no weight to these studies. They were conducted without adequate information as to the prevailing conditions, so that the results were impossible to interpret. I refer specifically to the fact that these studies designed to show that currents running to the south would not carry materials to the south were conducted by people who did not know which direction the currents were going in at the time they conducted the studies and took their samples. Neither did the persons who conducted the studies know where on the hydrograph and where on the pollutograph they were at the time they conducted their wet weather studies.

Furthermore, to the extent that these studies show an apparent decrease in the number of fecal coliforms contained in the top three feet of the water, they demonstrate nothing about the number of viruses that might have been in that top three feet of the water. The evidence is clear on both sides that you can have zero fecal coliforms and many viruses in the same parcel of water.

Moreover, the number of samples taken was insufficient. And the depth at which the samples were taken was insufficient to reflect the probable counts which might have been found at other levels.

Something which infected those studies from the outset and which perhaps accounts in some degree for the invalid methodology with which they were conducted was the attitude of Dr. Zanoni, who was in charge of them. It is not simply a matter of inference that Dr. Zanoni started wth the conclusions that he wished to reach and then fitted the data into those conclusions. It is a matter of his express acknowledgment from the witness stand that that is what he did.

If one were to look for a model of how a scientific study should not be conducted, I would commend him to the record of the Envirex net and shore studies. Dr. Zanoni was unwilling to recognize the slightest suggestion that the conclusions which he had reached were not borne out by his data. I could give many examples. I will give simply one. On his direct examination, he testified that the numbers of fecal coliform found in his samples were consistent with the numbers found by the City of Milwaukee in their samples and that this supported his conclusions. On cross examination it was pointed out to him that just the contrary was the case, that there were rather marked discrepancies between his figures and those obtained by the City. Dr. Zanoni's response to that was that he did not know whether the sampling methods conducted by the City were valid. They had been valid enough in his mind for him to tell me on direct examination that they confirmed his own findings, but when it appeared that they did not confirm his findings, he suddenly decided that there was something wrong with their sampling technique. When pursued further as to what their sampling technique was, it developed that he had not the slightest idea of what it was and had no reason whatsoever to suspect that there was any deficiency in it. I give this as one example of many that will be found by anyone who reads the record of Dr. Zanoni's testimony.

Another study conducted by Dr. Zanoni and Mr. Carter was the fecal coliform die-off study. To a lesser extent than in the case of the net and shore studies, this particular experiment is inconclusive at best. Again, only the top three feet of the water column were sampled. The number of samples taken was not small. The amount of water sampled was only a fraction of

the sample size recommended by standard methods. The die-off line which resulted from the study seems to me to have been put askew by an improper starting point. Finally, as I indicated earlier, the numbers of fecal coliform found in any level of the water column bear no particular relation to the number of viruses that might be found there.

Now, the State of Illinois had an opportunity to conduct its own study of the kind that Envirex conducted. It elected not to do so. In so electing, it is my opinion that the state chose to produce less evidence than it should have. My guess as to why they elected not to conduct their own study is that they were afraid of a negative result. Conducting such studies is dangerous because, of course, they cut both ways; but if the position of the State of Illinois is correct, as I believe it is, a properly conducted study should have resulted in some circumstancial evidence that would tend to confirm that theory.

The test would have had to be conducted without the infirmities that I have mentioned in regard to the Envirex studies, and that could have been done. In fact, negative results would not have been fatal to the plaintiffs' case.

Once these pathogens arrive in Illinois waters, they can infect and cause disease in residents of Illinois. This takes place in two ways: by ingestion of these waters at bathing beaches by swimmers and by ingestion of drinking water containing these pathogens.

The defendants' answer to this is that in regard to the bathing beaches, the risk is minimal because the numbers of pathogens are small, and that as far as drinking water is concerned, the treatment plants may be relied upon to remove any harmful organisms.

In regard to the bathing beaches, I am satisfied that the persons who use those beaches cannot do so with safety if there are any significant numbers of viruses in the water. There is a question as to how many viruses it takes to cause an infection. I can't solve that one. The experts are not in agreement, but I

believe, first of all, from the evidence I have heard, that the number is small. If one virus is insufficient, it still need not be hundreds. Moreover, the evidence shows that any viruses which do reach Illinois waters are likely to do so in great numbers.

There are fecal coliform counts on Illinois beaches which fail to demonstrate any pollution coming from Milwaukee, but again, that does not prove that viruses are not in the water.

As far as the treatment plants are concerned, the testimony of Dr. Wellings convinces me that viruses do get through water filtration plants attached to and embedded in solids, which can go through the filters of those plants, both when the plant is being operated properly and even more so should the plant experience a breakdown.

The defendants submitted evidence that there is a substantial diminution of the number of viruses which enter a sewage treatment plant before the effluent is discharged into the lake. There is no question that that is so. I think, however, that the primary factor which accounts for that is sedimentation. I do not believe from the evidence that there is any bacteriological kill of the viruses in the activated sludge process. I feel that Dr. Sproul's conclusions in that regard were based upon insufficient information. I agree with Dr. Wellings' analysis of the Moore study on that subject.

Despite the large percentage of viruses which are deactivated and removed in the process of sewage treatment, there is no question that large numbers of them do get through and are discharged to the lake because of the insufficient treatment of the solids in the effluent, I am satisfied from the testimony of Dr. Wellings and other witnesses in the case that unless there is a good removal of solids and a free chlorine residual, there is not an adequate kill of viruses. There is evidence in the record on both sides of the case which I find convincing on that point. The defendants never have a free chlorine residual by the amperometric test, which I find from the evidence is the more valid of the two methods of measuring a chlorine residual.

The defendants also argue that there is no evidence of any outbreak of water related diseases in Illinois, and this is true. However, I am persuaded by the expert testimony that the diseases caused by the pathogens in sewage are mostly of the kind, if not all of the kind, that are not likely to be reported, and if reported, are not likely to be diagnosed as a viral disease or even as a bacteriological disease related to water.

The expense and the time and the effort involved in identifying and isolating a virus which may have caused an infection in an individual who does present himself for medical treatment is so great that the effort is rarely undertaken. Therefore, I find that the absence of any reported outbreak of enteroviral diseases or of shigellosis or salmonellosis, or any of the other bacterial diseases, does not demonstrate that such diseases are not being contracted by residents of Illinois by reason of their exposure to waters of Lake Michigan which contain pathogens.

The diseases that are water-borne are generally not fatal diseases, but they are debilitating diseases. They are serious enough to be deemed a genuine health hazard and a legal nuisance. This is a value judgment, and perhaps someone else may feel that the symptoms of hepatitis and encephalitis and the other diseases shown by the record are not sufficient to constitute a nuisance. But that will be for someone else to say.

I feel that exposure to such diseases does warrant a legal remedy. The hazard is immediate, in that it is existing now. It existed yesterday. It will exist tomorrow. The defendants argue with considerable force that the mere possibility that an Illinois resident will contract a water-borne disease is insufficient to warrant the relief sought by the plaintiffs. They ask for the evidence of the actual outbreak of disease, the actual incidence of stomach aches and diarrhea and various symptoms which one might expect to find.

There are two problems with that approach. The first is that it is impossible to demonstrate that any particular disease contracted by any particular individual was contracted as a result of drinking water contaminated by reason of Milwaukee's

sewage. If the defendants want that kind of evidence, as they do, they will never receive it. It is impossible to produce.

The second problem with that approach is that it ignores the fact that exposure to a hazard, whether or not that exposure results in the actual contraction of a disease, is itself actionable. On the virtually undisputed evidence in this case, there is some degree of hazard to the residents of Illinois from Milwaukee's sewage. It is the degree of that hazard which is in dispute. Prevention is what public health is all about. Prevention is what equitable relief is all about, and it is not necessary to wait until an actual outbreak occurs to do something to prevent it. If you wait until it occurs, then, at least to that particular injury, you have waited too long.

There are some expressions in some of the cases which I think are pertinent, and I would like to read briefly from the case of *Missouri v. Illinois,* 180 U.S. 208, at pages 242 and 244. This case had to do with an effort by the State of Missouri to enjoin the City of Chicago from discharging its sewage to the river system and thereby allegedly polluting the Mississippi River. The position of the State of Illinois at this juncture of that particular litigation was that there had been no showing of any harm as yet, and the Supreme Court of the United States said:

> "In the first place, it is urged that the drawing by artificial means, of the sewage of the City of Chicago into the Mississippi River may or may not become a nuisance to the inhabitants, cities and towns of Missouri; that the injuries apprehended are merely eventual or contingent, and may, in fact, never be inflicted. Can it be gravely contended that there are no preventative remedies, by way of injunction or otherwise, against injuries not inflicted or experienced, but which would appear to be the natural result of acts of the defendant, which he admits or avows it to be his intention to commit?"

* * * *

> "The nature of equitable remedy in the case of public nuisances was well described by Mr. Justice Harlan speaking for the court in the case of *Mugler v. Kansas,* 123 U.S. 623, 673: 'The grounds of this jurisdiction in cases of purpresture, as well as of public nuisances, is the ability of courts of equity to give a more speedy, effectual and permanent remedy than can be had at law. They can not only prevent nuisances that are threatened, and before irreparable mischief ensues, but arrest or abate those in progress and by perpetual injunction protect the public against them in the future; whereas courts of law can only reach existing nuisances, leaving future acts to be the subject of new prosecutions or proceedings. This is a salutary jurisdiction, especially where a nuisance affects the health, morals, or safety of the community.'"

Another case which is pertinent to this point is the case of *Harris Stanley Coal and Land Company v. Chesapeake and Ohio Railway Company,* 154 F. 2d 450, a case decided by the Court of Appeals for the Sixth Circuit. The court said at page 454:

> "Though no injury had yet been shown to have been incurred by the railroad, possible future injuries may be enjoined... (citations omitted) and suits are not premature because the plaintiff does not await an actual test of the results of a proposed or threatened act."

It seems to me that in some of the arguments the defendants have presented in this case, they have confused two things. One is the elements of the cause of action which the plaintiffs must prove, and the other is the standard of proof by which those elements must be proved. The defendants contend that the evidence must be clear and convincing. I am adopting that view for purposes of this case. The second question is: What must the clear and convincing evidence show? The defendants take the view that because the evidence must be clear

and convincing, it must show an actual injury. Otherwise, it is not clear and convincing. It is my view and my understanding of the law that what the plaintiffs must show by clear and convincing evidence is the existence of a hazard, whether or not that hazard has in fact eventuated in an injury. The hazard itself is the injury justifying injunctive relief in this kind of case.

I find from what I regard as clear and convincing evidence that the discharge of sewage by the defendants into Lake Michigan contitutes a health hazard of serious magnitude to the residents of the State of Illinois and that, unless enjoined by this court, that danger will continue to exist.

I turn now to the second phase of the case, that involving the matter of accelerated eutrophication of Lake Michigan.

I have no doubt whatever from the evidence in this case that the amount of phosphorus in Lake Michigan is increasing. No one knows how much phosphorus was in the lake 20 years ago, nobody knows how much phosphorus was in the lake yesterday; but what is clear from the evidence beyond any doubt is that when phosphorus is put into the lake, it stays there for a long time. It stays there either in solution in the water itself or in the bio-mass — the algae, the organisms, both animal and vegetable, which use phosphorus in their life cycles — or it is in the bottom sediments, from which it can be recycled, that is, put back into solution over time.

A lot of numbers were testified to in this case. I think the one that was the most impressive to me was the number 100. It takes 100 years for Lake Michigan to empty itself into Lake Huron. It is literally a cul-de-sac which can be victimized by mistreatment in a manner that other lakes and water courses of greater defensive capability cannot be victimized.

Lake Erie, which is considered by all to be a polluted lake, at least in its western basin, renews itself in three years, because it is a shallow lake and a much smaller lake than Lake Michigan. Yet, we have seen that in the lifetime of most of the people in this room, Lake Erie has gone from a lake that was described as

oligotrophic to one that is considered eutrophic and a source of serious concern to the persons who depend upon it.

I find that as a result of the inputs of phosphorus and other nutrients to Lake Michigan, the lake is undergoing accelerated eutrophication. Accelerated eutrophication is that eutrophicaton which is caused by man, as opposed to the eutrophication which occurs inevitably and naturally.

The evidence of the accelerated eutrophication is the decrease in dissolved silica, which I find is due to its utilization by diatoms; a decrease in the diatom population; and an increase in blue-green algae, both in the in-shore zone and the off-shore zone.

Dr. Shapiro's theory that the problem is caused or that the manifestations I have referred to, if they exist at all, are caused by alewives rather than by phosphorus, is, I think, a less likely and less reasonable explanation. I agree with Dr. Schelske that the more logical and natural explanation is that the phosphorus inputs from both point and non-point sources have caused these phenomena.

Accelerated eutrophication results in taste and odor problems in the lake water. In an advanced state, this odor problem can affect the use of the water for recreational purposes, and even in a less advanced stage, it can cause problems with drinking water. I was impressed by the fact that the City of Green Bay, Wisconsin, which is located right on Green Bay, does not get its drinking water from Green Bay. Instead, it goes clear across the Door Peninsula, a distance of 50 miles or more, and brings its drinking water from Lake Michigan. The reason, of course, is that Green Bay, a large embayment of the lake, does not offer drinking water of the quality desired by the residents of that city.

The reason it does not is that the southern portion of Green Bay has undergone accelerated eutrophication and is a eutrophic part of the lake.

In addition to the odor and taste problems caused by eutrophication, there is a loss of the clarity of the water, which is an aesthetic value important to many people, and I think rightly so. A secchi disc in Lake Superior can be seen at a depth of 60 feet. In Lake Michigan it can be seen at a depth of 10 to 15 feet only. Lake Superior is an ologotrophic lake. Lake Michigan is becoming a lake which exhibits the turbidity typical of lakes inhabited by increasing populations of algae.

The accelerated eutrophication caused by these nutrient inputs is far greater in the in-shore zone than it is in the off-shore zone, but there is no reason to believe that the eutrophication found in the in-shore zone will not spread, and, if not stopped, that it will not spread clear across the lake. That is the way it happened in Lake Erie. The in-shore zones began to exhibit manifestations of eutrophication. The confident predictions of various experts that the problem would remain there were not borne out by what actually occurred.

Lake Michigan, of course, is a bigger lake and a deeper lake. But I have heard nothing in this evidence to persuade me that there is any reason to believe that the same process will not occur in Lake Michigan, except it will take longer.

I find that the waters of Lake Michigan within the territorial boundaries of the State of Illinois are undergoing a process of accelerated eutrophication at the present time and that this process is caused by nutrient inputs, some of which emanate from the defendants. As has been pointed out by everyone in this case, there is no method of identifying any particular molecule of phosphorus or nitrogen or any other chemical as having come from a particular location. But because the waters of the in-shore zone interchange with each other and do mix longitudinally along the shore, it is a fact, both inferrable circumstantially and deducible as a matter of logic, that all inputs of nutrients along the western shore contribute to the accelerated eutrophication of the entire western shore line.

The benthic studies do not persuade me of anything either way. Dr. Otto was frank enough to admit that their purpose was

not to demonstrate the absence of any long-term eutrophication process. But neither did those studies convince me that there are not perceptible short-term changes.

The Fitzgerald cladophora study was effectively rebutted by the testimony of the witness Renz. In fact, I felt that the testimony of Dr. Fitzgerald, when viewed in the light of those jars of cladophora that Mr. Renz was able to collect with no effort, was misleading, to say the least.

Because of the interchange of water between the in-shore zone and the off-shore zone and the eventual mixing of the entire lake, the State of Michigan is exposed to injury and is being injured by the discharges of nutrients by these defendants.

There is no evidence of any present effect of Milwaukee discharges or, for that matter, of the effect of any other nutrient discharges, on fish life in the lake. It does not appear to me that the plaintiffs attempted to adduce such evidence. The matter was simply adverted to in passing from time to time, but the evidence was insufficient to prove that the disappearance of the whitefish or the lake trout or any of the fish species which are in trouble in Lake Michigan is caused by nutrient inputs. There is, however, evidence in the record from both sides that in-shore eutrophication is very likely to cause eventual problems with the spawning grounds of most of the types of fish which inhabit the lake. Therefore, in that sense I think that the matter of in-shore eutrophication is relevant to the question of fish, not presently, but in terms of a danger which definitely exists for the future.

There is no evidence that any specific algal problem or any specific taste and odor problem experienced by residents of Illinois or Michigan is attributable to Milwaukee's sewage as opposed to the nutrients discharged by any other point or non-point source. This, indeed, is the nature of this problem. It is not possible to segment nutrient inputs and ascribe this part to one source and another part to another source. All point and non-point sources combine to create the totality of nutrient inputs to the lake.

This case has to be looked at in a temporal way differently than the ordinary nuisance case is looked at. Some of the problems we may have in analyzing the facts of this case and applying the law to those facts arise from the difficulty of analogizing the situation involved here to the more typical nuisance situation. In this case we are concerned with an injury which is occurring in very small parts over a long period of time, a time not measurable by any specific finite event. It is measured in decades if not in centuries and if not in geologic time. Lake Michigan is a resource that will be relied upon by the people who reside in its basin for all time to come — for as long as this planet is inhabited by human beings — and, therefore, the parameters of a nuisance in regard to that lake must have a temporal aspect consistent with that long term human need for the use of that lake.

We have given some attention to the nature of the defendants in this case as being municipal corporations possibly identical with the sovereign state of Wisconsin. I think the nature of the plaintiffs is something that we should consider as well. This is not an individual plaintiff suing on behalf of himself of even representing a presently existing class. The plaintiffs here are states who represent people who are now living and generations to come, and those generations to come have interests which are every bit as important as the interests of those of us who are alive today. This is not simply an expression of a matter of philosophy. I believe it to be a statement of the law.

The defendants have frequently asked questions of witnesses couched in terms of whether there is any "measurable" effect on the lake caused by Milwaukee's discharges, or whether, if Milwaukee's discharges were altogether discontinued, there would be any "measurable" diminution in the amount of nutrients in the lake. The question really answers itself. It is impossible to measure accurately. It is possible only to estimate, and sometimes the estimates are not based upon empirical data but are really a kind of logical or mathematical analysis; but the fact that the inputs are not reasurable or the outtakes, if you will, would not be measurable in terms of their effect, does not mean that the effects do not ex-

ist, any more than the absence of someone to hear a tree fall in the forest means that it does not make a sound when it falls.

The defendants argue seriously and I believe sincerely that their discharges to the lake must be viewed in terms of the total discharges to the lake, both point and non-point, and that it is unfair to single them out, as they think has occurred in this case.

There was evidence produced as to the loadings to the lake. It has hardly satisfactory. The testimony of Dr. Zanoni as to point and non-point loadings I regard as altogether speculative and unreliable. He relied upon documents which, as it turned out, he had not even read, and when those documents were analyzed on their own merits, they turned out to have serious deficiencies. I give no credence to the Envirex material in regard to nutrient loadings to the lake. I think the Schelske estimate, while obviously subject to a great possibility of error either way, is nonetheless a more reliable kind of approach to the problem.

In any event, I believe that one million pounds of phosphorus from the treatment plants alone, without considering additional phosphorus discharged by the overflows, is a significant input to the lake, and its removal would be a significant removal. We know that Milwuakee is the biggest point source on the lake and that, of the total point sources on the lake, the Milwaukee discharges constitute a substantial percentage.

Now, does the fact that we have little or no ability to control non-point discharges to the lake means that we ought to ignore the point discharges? I think the answer to that is no. There is a statement contained in the case of *Barrett v. Mount Greenwood Cemetery Association,* 159 Ill. 385, 390, 42 N.E. 891 (1896), which I think is appropriate:

> "But we know of no rule of law that sanctions one wrong because another has preceded it. It is doubtless true that streams of water cannot be kept as pure when flowing through lands occupied by populous communities as when flowing through

> sparsely settled lands, but these effects that *unavoidably* arise from the occupation and cultivation of the soil by man do not justify the *deliberate* pollution of the stream of water flowing through another private property, in order that the interests of private persons, or even the public, may be enhanced thereby." (emphasis added.)

There is a second basic fallacy in the defendants' argument, I believe. There can be no doubt that the combined discharges of all point sources contribute substantially to the eutrophication of the lake. If any one point source can defend successfully on the ground that its discharge alone is not causing the problem and that without its discharge the problem would still exist, then that defense must be equally available to all point dischargers. We cannot have one law for Milwaukee and another law for Waukegan, the North Shore Sanitary District, Gary and Muskegon. The law must be uniform, especially since we are dealing with the federal common law of nuisance, which the United States Supreme Court has said is peculiarly adaptable for use in the solution of interstate water problems.

I believe the law is that one discharger who contributes an aliquot of a total combined discharge which causes a problem may be enjoined from continuing his discharge. Either that is true or it is impossible to enjoin point discharges. If Milwaukee is entitled to discharge raw sewage into the lake and insufficiently treated sewage into the lake on the magnitude of 320 million gallons a day or more during wet weather periods, then can anyone say to Waukegan, Illinois, with a discharge of 10 million gallons a day, that it may not do the same thing? In fact, I have not done the computations, but I would think that 10 million gallons of raw sewage from Waukegan each day would not equal the total nutrient loadings that are going into the lake from Milwaukee's treated effluent. So, if the rule contended for by the defendants were to be the law, it seems to me it would follow that Waukegan would be entitled to discharge raw sewage into Lake Michigan.

I hesitate to make this analogy because there are probably things wrong with it, but it seems to me that in a case of this kind, where one is not dealing with a finite point, either in space or in time, but rather with a continual process affecting a natural body of water the size of Lake Michigan, that the law of nuisance involving numerous polluters is very akin to the law applicable to joint tortfeasors. Each person who contributes to the injury is liable, not for the conduct of anyone else, but for his own conduct in that it forms part of the cause of the total injury.

So both on the basis that I feel the evidence shows Milwaukee's discharges are of themselves a significant cause of pollution to the lake and, secondly, because undeniably its contribution to the total nutrient discharges to the lake cannot be isolated out either factually or legally, I reject Milwaukee's defense based upon lack of measurable contribution.

Viewed in this light, the argument about balancing the equities is really difficult to apply. If the equities are balanced for Milwaukee, then they have to be balanced for everybody. If the equities favor Milwaukee because each dollar of expenditure for better sewage treatment cannot be shown to result in a specific amount of benefit to the lake, then those same equities favor every other point discharger to the lake.

I suppose there is a minimum level below which a discharge would be de minimis, even though, as a matter of pure logic, all discharges form part of the whole. But we are not dealing with a de minimis situation here. We are not dealing with a level so low that the theory of liability is stretched to its logical extreme.

I find from what I believe is clear and convincing evidence that the defendants' sewage discharges into Lake Michigan are presently contributing in a substantial way to the accelerated eutrophication of the in-shore zone of the western shore of Lake Michigan, including waters of Lake Michigan which are within the territorial boundaries of the State of Illinois.

I find further, on the basis of clear and convincing evidence, that due to the interchange of waters in the in-shore and off-shore zones, the defendants' discharges, if continued at anything like present levels, will substantially contribute to the accelerated eutrophication of Lake Michigan as a whole, including waters within the territorial boundaries of the States of Illinois and Michigan.

While it might be argued that the deleterious impact of eutrophication is of a far lesser magnitude than the danger presented by pathogens in the water, I believe that the results of eutrophication are serious enough to be an enjoinable nuisance. This is especially true when the countervailing right that is asserted is the right to discharge sewage, and sometimes raw sewage, into Lake Michigan.

I would like to discuss the defendants' argument that the Illinois discharges into Lake Michigan are somehow a defense to the defendants. First of all, it is a fact that most point sources in Illinois are now out of Lake Michigan. To say that the once-a-year discharge that is contemplated by the Waukegan plant of the North Shore Sanitary District is to be considered in the same light as Milwaukee's discharge of 320 million gallons a day, plus overflows, is not, I think, a valid argument.

The defendants cite the cases of *Missouri v. Illinois,* 200 US 496 (1906), and *New York v. New Jersey,* 256 U.S. 296 (1921). Neither of those cases is applicable to the facts we have here. In both of those cases, the evidence showed that the pollution of which plaintiff was complaining already existed by virtue of plaintiff's own activities. The waters which it was seeking to protect were already so polluted by its own discharge that it could truly be said that any activity of the defendants would not add materially to the condition.

In the case of *New York v. New Jersey,* New York was discharging raw sewage from its entire population into New York Bay, a badly polluted body of water, and it was seeking to enjoin the discharge of primary effluent, which had at least received primary treatment, by the State of New Jersey into the

same bay. Clearly, that situation is distinguishable from this one where we are dealing with a body of water that is still relatively clean, despite what I have said about the accelerated eutrophication existing in the in-shore and off-shore zones. Further degradation is not only a possibility in this case, it is a certainty unless the defendants' discharges are terminated.

Furthermore, this is a nuisance case. Contributory negligence is not involved. Negligence is not involved.

Illinois does discharge effluents to other water courses. We are not dealing with those other water courses. We are dealing with Lake Michigan, and if pollution of the Illinois River and the Mississippi River results from the discharges of Illinois effluent, that is not material to a disposition of this cause dealing with an altogether different body of water. In addition, I note that the discharges which have been referred to primarily in this connection are those of the Metropolitan Sanitary District and the North Shore Sanitary District. These effluents have received advanced treatment, and they are being discharged into water courses which may, for all I know, have different qualities as receiving bodies than does Lake Michigan.

But in any event, I find no conduct on the part of the State of Illinois or the State of Michigan that would in any way estop these plaintiffs from the relief they are seeking against the defendants.

For the foregoing reasons, the court finds the issues on the question of liability in favor of the plaintiffs and against the defendants on all three counts of the complaint.

On the matter of the remedy, the situation has to be analyzed in terms of wet weather flows and dry weather flows, or rather in terms of wet weather flows and all flows.

As far as the wet weather flows are concerned, the witnesses for both sides were in agreement that overflows of raw sewage to Lake Michigan cannot be tolerated and must cease. I find that to be the fact. Whether the defendants agree to it or not, the discharge of raw sewage into the lake must cease.

The defendants have been studying the problem for a long time. I believe that there is little, if any, need for further study on the general proposition of what approach should be taken to the elimination of the overflows. I believe that there has been unnecessary delay on the part of the defendants in addressing the matter of eliminating the overflows, in the combined system, the separate system, the separate municipal areas, and the Metropolitan Interceptor System.

I read much of the material in the Combined Sewer Overflow study, and I find in it no express commitment to the elimination of the overflows. What I find is reference to "control" of the overflows and "reduction" of overflows. It is not altogther clear to me that the Combined Sewer study starts with the proposition that the overflows must be eliminated.

I can save a lot of time, and I am going to save a lot of time in the event any further study of that issues is contemplated, because it will be and it is the ruling of this court that all overflows shall be eliminated.

As far as the method is concerned, I am not going to get into the sanitary engineering business yet, and I hope that I will never have to. From the evidence that I have heard, it seems to me the sensible thing to do is to collect, transport, and treat. The alternatives that are discussed seemed to me alternatives which long since should have been discarded as impracticable, and I truly wonder what purpose is served by any further temporizing about end of the pipe treatment or satellite treatment or any of the various possibilities that have been the subject of discussion.

It is time now for adoption of a particular method that will result in the elimination of these overflows. I believe that faced with the necessity for doing that, Dr. Katz can get the job done. I will say that he has from the outset of this case impressed me as a person who is knowledgeable and sincere, and I believe that he can do it if he is given the cooperation he is going to need.

If the decision is to transport and treat, the defendants are either going to have to build some additional treatment facilities on a rather large scale, or they are going to have to build some detention facilities. From the evidence I have heard, it appears to me that the latter is the less expensive and more practicable alternative; but again, I am not going to order any particular method to be employed at this time. I am interested in results. The methods are a matter of design.

Now, turning from the matter of the discharge of raw sewage to the matter of treatment of all flows, including present dry weather flows and those wet weather flows which will in the future be collected and treated, I do not have the slightest doubt, on the basis of the evidence I have heard here, that for the protection of the interests asserted by the plaintiffs here and to effectuate the decision of this court, advanced waste treatment is necessary. That treatment must consist of coagulation and filtration — not carbon filtration, but sand or multi-media filtration, as the design may dictate. The effluent standards that should be sought are 5 milligrams per liter of BOD and 5 milligrams per liter of suspended solids. Phosphorus of less than 1 milligram per liter should be sought, and I believe will be an inevitable consequence of the installation of the type of advanced treatment which is being ordered.

I am not going to enter any order today on the question of averages. I do not think I have enough information to make a definitive statement on it. The considerations involved in the two kinds of injury we have been discussing here are, of course, different. The public health aspect of the case really requires that there be no input into the lake of an effluent which has not been effectively chlorinated, and, therefore, I can tell you now that any geometric average is out. It is going to have to be an arithmetic average, but of what dimensions, I am not sure, and I will not attempt to say now.

On the eutrophication questions, on the other hand, an average would not hurt because it does not make any difference whether the pounds go in today or next week. If you have a limit of so many pounds a month, that will get the job done. But the

people of Illinois can be infected with viruses that result from one day or one hour of inadequate chlorination. The fact that there are no viruses on the other six days of the week reduces the exposure obviously, but it does not eliminate it to the extent it is possible to do so. And I believe that to the extent it is possible to do so, the law requires elimination of the hazard.

As far as the averages are concerned, I have the impression from Mr. Culp's testimony that the problem may take care of itself. He felt that Mr. Gupta's effluent standards really did not correlate very well with the treatment modes he was cost estimating, and it may be that the design the defendants come up with will, as in the case of Lake Tahoe, be sufficient to get effluent standards even below the 5 and 5 with no really remarkable peaks.

I have considered the possibility of appointing an engineer to work with the defendants. I believe I will not do that today. I am hopeful that the defendants will comply with the terms of this order without the necessity of any close supervision by this court. The extent to which they do so will be a matter of their good faith and their desire to conform.

As I had the pleasure of saying the other day, the counsel that have represented both sides in this case have been truly outstanding. If they continue during the time that lies ahead as they have in the past, I think that they can work out the details that are going to be necessary to put into effect the terms of this order within a reasonable time.

I will say that I believe time is a matter of importance. I will countenance no undue delay. On the other hand, I will be reasonable. I will not be oppressive. But the defendants must realize that they have a job to do and they must get about it.

I realize, too, that there will be an appeal in this case, and we will have to discuss the matter of a stay of execution at such time as that question arises.

The terms of this order are binding upon the defendants whether or not federal financial assistance becomes available. I hope that federal assistance is made available, but if it is not, the program decreed by this order must proceed nonetheless.

This brings us to the matter of cost, as to which there has been considerable controversy in this case. I think we should break it down into two things, because it is easy to get carried away by the huge numbers that have been bruited about. In my view, the cost of eliminating the overflows is not really a factor here. It is a cost that this order will undoubtedly cause to be incurred long before it would have been incurred, but the cost of eliminating those overflows would have had to have been borne by the City in any event at some time, unless, of course, it intended to ignore the opinions of its own expert witnesses to the effect that overflows are undesirable and must be eliminated. So whatever it costs to eliminate the overflows is not attributable to this lawsuit, except that this lawsuit has provided a catalyst for that expenditure.

Now, as to what is going to be involved in the cost of advanced waste treatment, I regard Mr. Gupta's figures, to the extent that they differ from those of Mr. Culp, as being wholly unfounded and speculative. When all is said and done, and when one finishes talking about the millions and tens of millions, it appears from Mr. Culp's testimony, and indeed from the testimony of the defendants' witness, Heaps. that what we are talking about here is something on the order of $2 a month per household in the District. Now, I do not mean to say that $2 per month per household is an insignificant or insubstantial amount, but what I do suggest is that it is in those terms that this obligation should be measured rather than in the forbidding and ominous numbers with the long trains of zeroes at the end.

The defendants argue, again sincerely, that this is a matter of priorities and they they have questions of how much they are going to spend on their police department and how much they are going to spend on their fire department, how much for schools, and that this is a matter of ordering priorities. I agree that matters involving schools, fire protection, police protec-

tion, public libraries, are perhaps matters for the people of Milwaukee and Milwaukee County to decide for themselves according to their own values and structure of priorities, because those are local matters. Any wrong decision will have a local impact only.

Here, however, we are dealing with activities that affect not simply the people who reside in Milwaukee County, but rather affect a body of water which those people share with residents of other states. And while Milwaukee has the right to order its own priorities and the right to decide its own values, it does not have the right to order the priorities of the residents of other states or to dictate to them what their values ought to be.

Now, I will hear from counsel on the question of when the timetable should be submitted. I have no idea how long it should take to prepare such a timetable.

What do you suggest, Mr. Moerke?

MR. MOERKE: Does the Court contemplate that timetable will be prior to September 9th?

THE COURT: Yes.

MR. MOERKE: I would assume that.

THE COURT: Yes, because the timetable will be incorporated in the judgment order by reference if not actual physical incorporation.

MR. MOERKE: If the Court please, I really have no reaction to that at this moment.

THE COURT: I did not know whether you would or not. I do not know either.

MR. MOERKE: I think I should consult with my clients.

THE COURT: All right. Mr. Karaganis, do you have any suggestion?

MR. KARAGANIS: I would suggest that Mr. Moerke be given an opportunity to consult with his experts, and we will be glad to sit down with Mr. Moerke and work it out.

THE COURT: Let's do this. Let's have the two things coincide. Have the timetable or your explanations as to why you have been unable to devise one by September 9th.

MR. MOERKE: All right.

THE COURT: We will enter the judgment order on that date and make any decision in regard to the timetable at the same time.

MR. MOERKE: If the Court please —

THE COURT: Yes, Mr. Moerke?

MR. MOERKE: Would the Court contemplate any time for possible motions that might be made by the defendants?

THE COURT: You are certainly entitled to make motions, Mr. Moerke. I would not want you to take any time to rehash what we have just spent —

MR. MOERKE: I understand.

THE COURT: — a long time doing, and I don't think in a bench trial, to preserve your record, you need to make a post-trial motion. I don't want any such motion to delay moving ahead with the case, but if you have any kind of motion you want to make, make it within the same time.

File it sometime before the 9th of September, and I will rule on that at the same time I rule on the judgment.

MR. MOERKE: All right, fine. Thank you.

(Which were all the proceedings had
on the day and date aforesaid.)

PEOPLE OF the STATE OF ILLINOIS, ex rel. William J. SCOTT, Attorney General of the State of Illinois, Plaintiff,

People of the State of Michigan, Intervening Plaintiff,

v.

CITY OF MILWAUKEE, WISCONSIN, et al., Defendants.

No. 72 C 1253

United States District Court,
N. D. Illinois, E. D.
Nov. 1, 1973.

MEMORANDUM OPINION AND ORDER

BAUER, District Judge.

This cause comes on the motion of the defendants City of Milwaukee, the Sewage Commission of the City of Milwaukee, the Metropolitan Sewage Commission of the County of Milwaukee, and the City of South Milwaukee to dismiss the complaint pursuant to Rule 12(b) of the Federal Rules of Civil Procedure.

The plaintiff, the People of the State of Illinois, consists of the more than 11 million residents of Illinois, a sovereign state of the United States of America. Plaintiff alleges that it has a vital concern with matters of environmental quality affecting its air, land and water and in this regard has enacted comprehensive environmental legislation (the Illinois Environmental Protection Act of 1970, Ill.Rev.Stat.1971, Ch. 111½, §1001 et seq.), which legislation includes concern over pollution of the water of the State of Illinois, whether such pollution occurs as a

result of discharges within or outside of Illinois. The People of the State of Michigan join in this action as an intervening plaintiff.

The defendants, City of Milwaukee, City of Kenosha, City of Racine, City of South Milwaukee are municipalities incorporated under the laws of the State of Wisconsin, political subdivisions thereof, and hence citizens of that State; the defendant Sewage Commission of the City of Milwaukee is charged by law with the duty of collecting, transmitting and disposing of the City's sewage; while the defendant Metropolitan Sewage Commission of the County of Milwaukee has the responsibility for the transmission, treatment, and disposal of sewage from territory located within its drainage area.

The plaintiff in the complaint alleges that the People of the State of Illinois are being injured by the defendant's practice of depositing raw sewage in Lake Michigan thereby causing pollution of Illinois' territorial waters of Lake Michigan. The plaintiff seeks an injunction against defendants prohibiting the complained of practice. This action is based on a federal question and diversity of citizenship jurisdiction pursuant to §§1331(a) and 1332. The plaintiff, in its complaint, alleges an action based on: (1) federal common law nuisance involving interstate waters; (2) violations of the Illinois Environmental Protection Act, 111½ Ill.Rev.Stat. §1001; and (3) state common law nuisance. The Supreme Court of the United States has previously declined to exercise jurisdiction in this cause, holding that pollution of interstate or navigable water could be abated under a federal common law claim based on nuisance and that such action was one "arising under" the laws of the United States within the meaning of 28 U.S.C. §1331(a) and within the jurisdiction of the federal district courts. Illinois v. Milwaukee, 406 U.S. 91, 92 S.Ct. 1385, 31 L.Ed.2d 712 (1927).

The defendants, in support of their instant motion, contend that the federal common law nuisance action has been preempted by the Federal Water Pollution Control Act, 33 U.S.C. §1151, et seq., as amended by P.L. 92-500, October 18, 1972. The plaintiff in opposition to the instant motion contends

that the instant cause of action has not been preempted by the 1972 amendments to the Federal Water Pollution Control Act (Water Pollution Prevention and Control Act of 1972, 33 U.S.C. §1251, et seq., P.L. 92-500).

It is the opinion of this Court that the defendants' motion is without merit.

I. THE FEDERAL WATER POLLUTION CONTROL ACT, 33 U.S.C. §1551, et seq., AS AMENDED BY P.L. 92-500, OCTOBER 18, 1972 DOES NOT PREEMPT THE STATE OF ILLINOIS' RIGHT TO SEEK ABATEMENT IN FEDERAL DISTRICT COURT OF A FEDERAL COMMON LAW NUISANCE IN INTERSTATE OR NAVIGABLE WATERS.

A. *Pre-1972 Amendments*

To properly understand the historical development of the 1972 amendments to the Federal Water Pollution Control Act, one must first examine the status of the law as it existed prior to those amendments. Prior to the 1972 amendments, the Supreme Court and other courts repeatedly rejected the contention that the Federal Water Pollution Control Act preempted the right of states to seek common law nuisance relief from water pollution in state or federal courts. This consistent rejection was made in response to the specific argument that the Federal Water Pollution Control Act was a congressional attempt to create a comprehensive and uniform federal control program. See Illinois v. Milwaukee, *supra;* Ohio v. Wyandotte Chemical Company, 401 U.S. 49, 91 S.Ct. 1005, 28 L.Ed.2d 256 (1971); United States v. Bushey, 346 F.Supp. 145 (D.C.Vt.1972).

The application of federal common law to abate a public nuisance in interstate or navigable waters is not inconsistent with the Federal Water Pollution Control Act. Illinois v. Milwaukee, *supra.* The federal scheme is not pre-emptive of state action. Section 1(b) of the Federal Water Pollution Control Act declares that the policy of Congress is to recognize,

preserve, and protect the primary responsibilities and rights of the states in preventing and controlling water pollution, 33 U.S.C. §1151(b) (1970 ed.). Section 10 of that act provides that except where the Attorney General has actually obtained a court order of pollution abatement on behalf of the United States, "State and interstate action to abate polution of . . . navigable waters . . . shall not, . . . be displaced by Federal enforcement action," 33 U.S.C. §1160(b) (1971 ed.). The Environmental Quality Improvement Act of 1970, 84 Stat. 114, 42 U.S.C. §4371 (1970 ed.), while stating the general policy of Congress is protecting the environment, also states: "the primary responsibility for implementing this policy rests with State and local governments" 42 U.S.C. §4371(b)(2) (1970 ed.). Under federal law in 1970, states did indeed have primary responsibility for setting water quality standards; the federal agencies only set water quality standards for a state if the state defaulted. 33 U.S.C. §1160(c) (1970 ed.).

Where Congress specifically intends that its exercise of statutory powers should preempt all other remedies it has expressly so stated that it is preempting such remedies. For example, 33 U.S.C. §1163(f) expressly prohibits action beyond the terms of the Federal Water Pollution Control Act with respect to the regulation of marine sanitation devices. In contrast, other sections of the Federal Water Pollution Control Act, e.g. 33 U.S.C. §§1151(b), 1151(c), indicate that much residual authority was left apart from the provisions of the Federal Water Pollution Control Act.[1]

B. *The 1972 Amendments*

An analysis of the 1972 amendments of the Federal Water Pollution Control Act clearly shows that Congress in no way in-

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[1] Similarly, the Supreme Court, in construing the Clean Air Act, 42 U.S.C. §1857, et seq., has held that statutory preemption only exists where Congress has explicitly so stated; and that non-statutory remedies such as federal common law nuisances exist where there has been no express preemption. See Washington v. General Motors Corp., 406 U.S. 109, 92 S.Ct. 1396, 31 L.Ed.2d 727 (1972).

tended to destroy any remedies available to the states prior to the passage of the 1972 amendments. Thus, in §101(b), the Congress adopts a statement very similar to that which previously existed in 33 U.S.C. §1151(b):

> "It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of the States to prevent, reduce and eliminate pollution."

In addition, the 1972 amendments adopted a provision similar to 33 U.S.C. §1151(c). Specifically §510 of the 1972 amendments states:

> "Except as expressly provided in this chapter nothing . . . shall . . . (2) be construed as impairing or in any manner affecting any right or jurisdiction of the States with respect to the waters (including boundary waters) of such States."

Nowhere do the 1972 amendments express any intention of eliminating the rights of the states to seek common law nuisance protection either in the state or federal courts, as enunciated in Ohio v. Wyandotte Chemical Co., *supra,* and Illinois v. Milwaukee, *supra.*

Moreover, Congress was very explicit in the 1972 amendments where it intended to preempt state authority and to make the statutory structure of the amendments the exclusive remedial scheme. Thus, Section 312(f)(1) of the 1972 amendments expressly prohibits any state action with regard to the regulation of marine sanitation devices. If Congress had intended to preempt the common law rights of the states under the *Milwaukee* doctrine, it surely would have expressly stated such intent in the act and would not have utilized the language contained in Section 101(b) and Section 510(2). Further, it is well settled that statutes will not be construed in derogation of common law unless such intent is clear from the words of the statute. Isbrandtsen v. Johnson, 343 U.S. 779, 72 S.Ct. 1011, 96 L.Ed. 1294 (1952). It is clear that the 1972 amendments to the

Federal Water Pollution Control Act did not and were not intended to preempt actions based on federal common law nuisances.

II. REGULATIONS PROMULGATED BY THE ENVIRONMENTAL PROTECTION AGENCY DO NOT DEMONSTRATE THE PREEMPTION OF ANY FEDERAL COMMON LAW RIGHT.

The defendants contend that the promulgation of two recent regulations, namely 40 C.F.R. 125 and 40 C.F.R. 130, by the Environmental Protection Agency preempts the federal common law right to bring a nuisance action for the pollution of interstate waters. More specifically, the defendants contend that at the time *Milwaukee* doctrine was predicated there were no existing standards or regulations capable of preempting federal common law action; however, the recent promulgation by the Environmental Protection Agency of two regulations now set up a uniform federal law which preempts federal common law rights.

Contrary to the defendants' contention, detailed and complex regulations governing water quality and waste discharges and permits existed under the pre-1972 Federal Water Pollution Control Act, 33 U.S.C. §1151, et seq.[2]

Despite the existence of these regulations and the statutory provisions of the pre-1972 Federal Water Pollution Control Act, the United States Supreme Court held that these regulations and statutes did not preempt the common law nuisance ac-

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[2] See, e.g., the Joint Permit Program of the U.S. Environmental Protection Agency and the Army Corps of Engineers, 36 F.R. 6564, et seq., April 1, 1971.

tion. Illinois v. Milwaukee, *supra,* 406 U.S. at 103, 92 S.Ct. 1385.[3]

There is much concern over the fact that in spite of the arsenal of federal power little is being done about water pollution.[4] That, of course, is not the issue before this Court. However, it is clear that the central issue raised by the instant motion is whether state action is preempted by federal law and regulations, and thus whether the protection of interstate waters has been left solely to the federally enacted statutes and standards.

Given the express intention of Congress to allow the states to establish tougher standards of performance it would seem illogical to argue that Congress intended the states to be bound solely by federal standards. The purpose of the Federal Water Pollution Control Act and its 1972 amendments was not to preempt but to supplement and amplify any pre-existing remedies. United States v. Bushey, 363 F.Supp. 110 (D.Vt. August 21, 1973). Consequently, the defendants' instant motion should be denied.

Accordingly, it is hereby ordered that the defendants' motion to dismiss is denied.

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[3] Similarly the defendants' view of the restrictions of §510 is inaccurate. While §510 prohibits the states from adopting less stringent or easier standards of performance, §510 was expressly intended to allow states to require more stringent or tougher standards of performance than required by the federal government. The House-Senate Conference Committee specifically states:

> "Section 510 provides that States, political subdivisions, and interstate agencies retain the right to set more restrictive standards and limitations than those imposed under this Act." *"Joint Explanatory Statement of the Committee of Conference"*, 92-1326, 1972 U.S.Code Cong. and Admin. News, Vol. 11, p.3776 at 3825.

[4] See Polikoff, "The Interlake Affair," Wash.Monthly, Vol. 3, No. 1, p. 7 (Mar. 1971).

PEOPLE OF the STATE OF ILLINOIS, ex rel. William J. SCOTT, Attorney General of the State of Illinois, Plaintiff,

People of the State of Michigan, Intervening Plaintiff,

v.

CITY OF MILWAUKEE, WISCONSIN, et al., Defendants.

No. 72 C 1253

United States District Court,
N. D. Illinois, E. D.
Nov. 16, 1972.

MEMORANDUM OPINION AND ORDER

BAUER, J.:

This cause comes on the motions of defendants City of Milwaukee and Sewerage Commission of the City of Milwaukee and of defendant Metropolitan Sewerage Commission of the County of Milwaukee to quash service of process and dismiss the action for lack of personal jurisdiction over these defendants and for improper venue.

Plaintiff, the State of Illinois ("Illinois"), charging that its residents are being injured by defendants' alleged practice of depositing raw sewage in Lake Michigan and of thereby causing pollution of Illinois' territorial waters of Lake Michigan, seeks an injunction against defendants prohibiting this practice. The action, founded upon both federal question and diversity jurisdiction, pursuant to 28 U.S.C. §§1331(a) and 1332, alleges (1) federal common law nuisance involving interstate waters, (2) violations of the Illinois Environmental Protection Act, 111 1/2

Ill. Rev. Stat. §1001, and (3) state common law nuisance. The Supreme Court previously declined to exercise jurisdiction in this cause, stating that the action would lie in the appropriate federal district court, pursuant to 28 U.S.C. §1331(a), as a cause of action under the federal common law of nuisance since the dispute involved interstate waters.[1]

The principal grounds of the instant motions are those of personal jurisdiction and venue. Defendants content (1) that, as municipal corporations, they are not susceptible to service of process from an out-of-state court and (2) that, since this action is not founded solely in diversity, under the provisions of 28 U.S.C. §1391(b) it should be brought only in the judicial district wherein all defendants reside.

With respect to this Court's jurisdiction over these defendants, the Court notes that personal service of process was effected pursuant to the Illinois long-arm statute, 110 Ill. Rev. Stat. §17. Not only is that statute applicable where diversity jurisdiction is alleged (here, in Counts II and III of the Complaint), but it has been held applicable also in cases involving federal question jurisdiction. See, e.g., *Metropolitan Sanitary District of Greater Chicago v. General Electric Co.*, 35 F.R.D. 131 (N.D. Ill. 1964).

The constitutional arguments raised by defendants in contesting the use of long-arm service in the instant case are readily overcome. The constitutionality of the Illinois statute has been upheld on the basis that due process requirements are met if defendants, having minimum contacts with the State, "incur obligations to those entitled to the State's protection." *Nelson v. Miller,* 11 Ill.2d 378, 389 (1957). Furthermore, when defendant can reasonably contemplate that his product will eventually reach the forum state where the injury occurred, he has established sufficient contacts with that state. *Gray v. American Radiator and Standard Sanitary Corp.*, 22 Ill.2d 432 (1961);

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[1] *Illinois v. City of Milwaukee,* _____ U.S. _____, 92 S.Ct. 1385 [4 ERC 1001] (April 24, 1972).

Anderson v. Penncraft Tool Co., 200 F.Supp. 145 (N.D. Ill. 1961). Since these defendants could reasonably contemplate that the sewage which they discharge would eventually reach Illinois territorial waters of Lake Michigan, which is the situs of the alleged injury to plaintiff, this Court holds that the service of process pursuant to the Illinois long-arm statute was valid.

Defendants attempt to buttress their arguments against personal jurisdiction of this Court through assertions that actions against them are inherently local in nature. However, it is clear that where the relief sought is injunctive and pertaining specifically to the named defendants, as here, the action is transitory. Thus, these defendants must be subject to personal jurisdiction of this Court.

The appropriate portion of the venue statute, 28 U.S.C. §1391(b) provides that:

> A civil action wherein jurisdiction is not founded solely on diversity of citizenship may be brought only in the judicial district where all defendants reside, or in which the claim arose, except as otherwise provided by law.

Contesting the venue of this Court, defendants cite numerous cases for the proposition that the appropriate venue for this action is the district in which all defendants reside, the Eastern District of Wisconsin. However, all but one of these cases was decided prior to the enactment of the 1966 amendment to §1391(b), which added the words "or in which the claim arose"; thus, such authority need not be considered. The remaining case, *Cole v. Trustees of Columbia University,* 300 F.Supp. 1026 (S.D. N.Y. 1969), was concerned primarily with overriding governmental policy in not subjecting Senate subcommittee members to suit in any federal district court in the county. Since this case cannot imply such far-reaching consequences, this Court is not bound by *Cole* in its determination of venue. Following the Supreme Court's observation in footnote 19 of its opinion in the instant case, *supra,* that this action may be brought only "in the judicial district where all defendants

reside, or in which the claim arose," 28 U.S.C. §1391(b), thereby giving flexibility to the choice of venue," this Court concludes that venue in the United States District for the Northern District of Illinois is appropriate. The claim of plaintiff arose in the Northern District of Illinois, where the injury occurred. See *Gray v. American Radiator and Standard Sanitary Corp., supra.*

Accordingly, it is hereby ordered that defendants' motions to quash service of process and to dismiss are denied.

ILLINOIS *v.* CITY OF MILWAUKEE, WISCONSIN, ET AL.

ON MOTION FOR LEAVE TO FILE BILL OF COMPLAINT

No. 49, Orig. Argued February 29, 1972—Decided April 24, 1972

Fred F. Herzog argued the cause for plaintiff. With him on the briefs was *William J. Scott*, Attorney General of Illinois.

Harry G. Slater argued the cause for defendants. With him on the brief for defendant City of Milwaukee were *John J. Fleming* and *Richard F. Maruszewski*. *Michael S. Fisher* and *Burton A. Scott* filed a brief for defendant City of Kenosha. *Jack Harvey*, *Edward A. Krenzke*, and *Louis J. Roshar* filed a brief for defendant City of Racine. *Mr. Fleming* and *Harvey G. Odenbrett* filed a brief for defendant Sewerage Commission of the City of Milwaukee. *Ewald L. Moerke, Jr.*, filed a brief for defendant Metropolitan Sewerage Commission of the County of Milwaukee.

MR. JUSTICE DOUGLAS delivered the opinion of the Court.

This is a motion by Illinois to file a bill of complaint under our original jurisdiction against four cities of Wisconsin, the Sewerage Commission of the City of Milwaukee, and the Metropolitan Sewerage Commission of the County of Milwaukee. The cause of action alleged is pollution by the defendants of Lake Michigan, a body of interstate water. According to plaintiff, some 200 million gallons of raw or inadequately treated sewage and other waste materials are discharged daily into the lake in the Milwaukee area alone. Plaintiff alleges that it and its subdivisions prohibit and prevent such discharges, but that the defendants do not take such actions. Plaintiff asks that we abate this public nuisance.

I

Article III, § 2, cl. 2, of the Constitution provides: "In all Cases . . . in which a State shall be Party, the supreme Court shall have original Jurisdiction." Congress has provided in 28 U. S. C. § 1251 that "(a) the Supreme Court shall have original and exclusive jurisdiction of: (1) All controversies between two or more States."

It has long been this Court's philosophy that "our original jurisdiction should be invoked sparingly." *Utah* v. *United States*, 394 U. S. 89, 95. We construe 28 U. S. C. § 1251 (a)(1), as we do Art. III, § 2, cl. 2, to honor our original jurisdiction but to make it obligatory only in appropriate cases. And the question of what is appropriate concerns, of course, the seriousness and dignity of the claim; yet beyond that it necessarily involves the availability of another forum where there is jurisdiction over the named parties, where the issues tendered may be litigated, and where appropriate relief may be had. We

incline to a sparing use of our original jurisdiction so that our increasing duties with the appellate docket will not suffer. *Washington* v. *General Motors Corp.*, *post*, p. 109.

Illinois presses its request for leave to file saying that the agencies named as defendants are instrumentalities of Wisconsin and therefore that this is a suit against Wisconsin which could not be brought in any other forum.

Under our decisions there is no doubt that the actions of public entities might, under appropriate pleadings, be attributed to a State so as to warrant a joinder of the State as party defendant.

In *Missouri* v. *Illinois*, 180 U. S. 208, Missouri invoked our original jurisdiction by an action against the State of Illinois and the Sanitary District of the City of Chicago, seeking an injunction to restrain the discharge of raw sewage into the Mississippi River. On a demurrer to the motion for leave to file a bill of complaint, Illinois argued that the Sanitary District was the proper defendant and that Illinois should not have been made a party. That argument was rejected:

> "The contention . . . seems to be that, because the matters complained of in the bill proceed and will continue to proceed from the acts of the Sanitary District of Chicago, a corporation of the State of Illinois, it therefore follows that the State, as such, is not interested in the question, and is improperly made a party.
>
> "We are unable to see the force of this suggestion. The bill does not allege that the Sanitary District is acting without or in excess of lawful authority. The averment and the conceded facts are that the corporation is an agency of the State to do the very things which, according to the theory of the complainant's case, will result in the mischief to be ap-

prehended. It is state action and its results that are complained of—thus distinguishing this case from that of *Louisiana* v. *Texas* [176 U. S. 1], where the acts sought to be restrained were alleged to be those of officers or functionaries proceeding in a wrongful and malevolent misapplication of the quarantine laws of Texas. The Sanitary District of Chicago is not a private corporation, formed for purposes of private gain, but a public corporation, whose existence and operations are wholly within the control of the State.

"The object of the bill is to subject this public work to judicial supervision, upon the allegation that the method of its construction and maintenance will create a continuing nuisance, dangerous to the health of a neighboring State and its inhabitants. Surely, in such a case, the State of Illinois would have a right to appear and traverse the allegations of the bill, and, having such a right, might properly be made a party defendant." 180 U. S., at 242.

In *New York* v. *New Jersey*, 256 U. S. 296, the State of New York brought an original action against the State of New Jersey and the Passaic Valley Sewerage Commissioners, seeking an injunction against the discharge of sewage into Upper New York Bay. The question was whether the actions of the sewage agency could be attributed to New Jersey so as to make that State responsible for them. The Court said:

"Also, for the purpose of showing the responsibility of the State of New Jersey for the proposed action of the defendant, the Passaic Valley Sewerage Commissioners, the bill sets out, with much detail, the acts of the legislature of that State authorizing and directing such action on their part.

> "Of this it is sufficient to say that the averments of the bill, quite undenied, show that the defendant sewerage commissioners constitute such a statutory, corporate agency of the State that their action, actual or intended, must be treated as that of the State itself, and we shall so regard it." 256 U. S., at 302.

The most recent case is *New Jersey* v. *New York*, 345 U. S. 369. The action was originally brought by the State of New Jersey against the City and State of New York for injunctive relief against the diversion of waters from Delaware River tributaries lying within New York State. Pennsylvania was subsequently allowed to intervene. The question presented by this decision was the right of the City of Philadelphia also to intervene in the proceedings as a party plaintiff. The issues raised were broad:

> "All of the present parties to the litigation have formally opposed the motion to intervene on grounds (1) that the intervention would permit a suit against a state by a citizen of another state in contravention of the Eleventh Amendment; (2) that the Commonwealth of Pennsylvania has the exclusive right to represent the interest of Philadelphia as *parens patriae;* and (3) that intervention should be denied, in any event, as a matter of sound discretion." 345 U. S., at 372.

We denied the City of Philadelphia's motion to intervene, saying:

> "The City of Philadelphia represents only a part of the citizens of Pennsylvania who reside in the watershed area of the Delaware River and its tributaries and depend upon those waters. If we undertook to evaluate all the separate interests within Pennsylvania, we could, in effect, be drawn into an

intramural dispute over the distribution of water within the Commonwealth. . . .

"Our original jurisdiction should not be thus expanded to the dimensions of ordinary class actions. An intervenor whose state is already a party should have the burden of showing some compelling interest in his own right, apart from his interest in a class with all other citizens and creatures of the state, which interest is not properly represented by the state." 345 U. S., at 373.

We added:

"The presence of New York City in this litigation is urged as a reason for permitting Philadelphia to intervene. But the argument misconstrues New York City's position in the case. New York City was not admitted into this litigation as a matter of discretion at her request. She was forcibly joined as a defendant to the original action since she was the authorized agent for the execution of the sovereign policy which threatened injury to the citizens of New Jersey. Because of this position as a defendant, subordinate to the parent state as the primary defendant, New York City's position in the case raises no problems under the Eleventh Amendment." 345 U. S., at 374–375.

We conclude that while, under appropriate pleadings, Wisconsin could be joined as a defendant in the present controversy, it is not mandatory that it be made one.

It is well settled that for the purposes of diversity of citizenship, political subdivisions are citizens of their respective States.[1] *Bullard* v. *City of Cisco*, 290 U. S. 179;

[1] It is equally well settled that a suit between a State and a citizen of another State is not a suit between citizens of different States for the purposes of diversity of citizenship jurisdiction. *Postal Telegraph Cable Co.* v. *Alabama*, 155 U. S. 482, 487.

Cowles v. *Mercer County*, 7 Wall. 118, 122. If a political subdivision is a citizen for diversity purposes, then it would make no jurisdictional difference whether it was the plaintiff or defendant in such an action. That being the case, a political subdivision in one State would be able to bring an action founded upon diversity jurisdiction against a political subdivision of another State.

We therefore conclude that the term "States" as used in 28 U. S. C. § 1251 (a)(1) should not be read to include their political subdivisions. That, of course, does not mean that political subdivisions of a State may not be sued under the head of our original jurisdiction, for 28 U. S. C. § 1251 provides that "(b) the Supreme Court shall have original but not exclusive jurisdiction of: (3) all actions or proceedings by a State against the citizens of another State . . . ."

If the named public entities of Wisconsin may, however, be sued by Illinois in a federal district court, our original jurisdiction is not mandatory.

It is to that aspect of the case that we now turn.

II

Title 28 U. S. C. § 1331 (a) provides that "[t]he district courts shall have original jurisdiction of all civil actions wherein the matter in controversy exceeds the sum or value of $10,000, exclusive of interest and costs, and arises under the Constitution, laws, or treaties of the United States."

The considerable interests involved in the purity of interstate waters would seem to put beyond question the jurisdictional amount provided in § 1331 (a). See *Glenwood Light & Water Co.* v. *Mutual Light, Heat & Power Co.*, 239 U. S. 121; *Mississippi & Missouri R. Co.* v. *Ward*, 2 Black 485, 492; *Ronzio* v. *Denver & R. G. W. R. Co.*, 116 F. 2d 604, 606; C. Wright, The Law of Federal Courts 117–119 (2d ed. 1970); Note, 73 Harv. L. Rev. 1369.

The question is whether pollution of interstate or navigable waters creates actions arising under the "laws" of the United States within the meaning of § 1331(a). We hold that it does; and we also hold that § 1331 (a) includes suits brought by a State.

MR. JUSTICE BRENNAN, speaking for the four members of this Court in *Romero* v. *International Terminal Operating Co.*, 358 U. S. 354, 393 (dissenting and concurring), who reached the issue, concluded that "laws," within the meaning of § 1331 (a), embraced claims founded on federal common law:

> "The contention cannot be accepted that since petitioner's rights are judicially defined, they are not created by 'the laws . . . of the United States' within the meaning of § 1331 . . . . In another context, that of state law, this Court has recognized that the statutory word 'laws' includes court decisions. The converse situation is presented here in that federal courts have an extensive responsibility of fashioning rules of substantive law . . . . These rules are as fully 'laws' of the United States as if they had been enacted by Congress." (Citations omitted.)

Lower courts have reached the same conclusion. See, *e. g.*, *Murphy* v. *Colonial Federal Savings & Loan Assn.*, 388 F. 2d 609, 611–612 (CA2 1967); *Stokes* v. *Adair*, 265 F. 2d 662 (CA4 1959); *Mater* v. *Holley*, 200 F. 2d 123 (CA5 1952); American Law Institute, Study of the Division of Jurisdiction Between State and Federal Courts 180–182 (1969).

Judge Harvey M. Johnsen in *Texas* v. *Pankey*, 441 F. 2d 236, 240, stated the controlling principle:

> "As the field of federal common law has been given necessary expansion into matters of federal concern and relationship (where no applicable fed-

eral statute exists, as there does not here), the ecological rights of a State in the improper impairment of them from sources outside the State's own territory, now would and should, we think, be held to be a matter having basis and standard in federal common law and so directly constituting a question arising under the laws of the United States."

Chief Judge Lumbard, speaking for the panel in *Ivy Broadcasting Co.* v. *American Tel. & Tel. Co.*, 391 F. 2d 486, 492, expressed the same view as follows:

"We believe that a cause of action similarly 'arises under' federal law if the dispositive issues stated in the complaint require the application of federal common law . . . . The word 'laws' in § 1331 should be construed to include laws created by federal judicial decisions as well as by congressional legislation. The rationale of the 1875 grant of federal question jurisdiction—to insure the availability of a forum designed to minimize the danger of hostility toward, and specially suited to the vindication of, federally created rights—is as applicable to judicially created rights as to rights created by statute." (Citations omitted.)

We see no reason not to give "laws" its natural meaning, see *Romero* v. *International Terminal Operating Co.*, *supra*, at 393 n. 5 (BRENNAN, J., dissenting and concurring), and therefore conclude that § 1331 jurisdiction will support claims founded upon federal common law as well as those of a statutory origin.

As respects the power of a State to bring an action under § 1331 (a), *Ames* v. *Kansas*, 111 U. S. 449, 470–472, is controlling. There Kansas had sued a number of corporations in its own courts and, since federal rights were involved, the defendants had the cases removed to the federal court. Kansas resisted, saying that the federal court lacked jurisdiction because of Art. III,

§ 2, cl. 2, of the Constitution, which gives this Court "original Jurisdiction" in "all Cases . . . in which a State shall be Party." The Court held that where a State is suing parties who are not other States, the original jurisdiction of this Court is not exclusive (*id.*, at 470) and that those suits "may now be brought in or removed to the Circuit Courts [now the District Courts] without regard to the character of the parties." [2] *Ibid.* We adhere to that ruling.

III

Congress has enacted numerous laws touching interstate waters. In 1899 it established some surveillance by the Army Corps of Engineers over industrial pollution, not including sewage, Rivers and Harbors Act of March 3, 1899, 30 Stat. 1121, a grant of power which we construed in *United States* v. *Republic Steel Corp.*, 362 U. S. 482, and in *United States* v. *Standard Oil Co.*, 384 U. S. 224.

The 1899 Act has been reinforced and broadened by a complex of laws recently enacted. The Federal Water Pollution Control Act, 62 Stat. 1155, as amended, 33 U. S. C. § 1151, tightens control over discharges into navigable waters so as not to lower applicable water quality standards. By the National Environmental Policy Act of 1969, 83 Stat. 852, 42 U. S. C. § 4321 *et seq.*, Congress "authorizes and directs" that "the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act" and that "all agencies of the Federal Government shall . . . identify and develop methods and procedures . . . which will insure that presently unquantified environmental amenities and values

[2] See also H. R. Rep. No. 308, 80th Cong., 1st Sess., A 104 (1947): "The original jurisdiction conferred on the Supreme Court by Article 3, section 2, of the Constitution is not exclusive by virtue of that provision alone. Congress may provide for or deny exclusiveness."

may be given appropriate consideration in decisionmaking along with economic and technical considerations." Sec. 102, 42 U. S. C. § 4332. Congress has evinced increasing concern with the quality of the aquatic environment as it affects the conservation and safeguarding of fish and wildlife resources. See, *e. g.*, Fish and Wildlife Act of 1956, 70 Stat. 1119, 16 U. S. C. § 742a; the Act of Sept. 22, 1959, 73 Stat. 642, authorizing research in migratory marine game fish, 16 U. S. C. § 760e; and the Fish and Wildlife Coordination Act, 48 Stat. 401, as amended, 16 U. S. C. § 661.

Buttressed by these new and expanding policies, the Corps of Engineers has issued new Rules and Regulations governing permits for discharges or deposits into navigable waters. 36 Fed. Reg. 6564 *et seq.*

The Federal Water Pollution Control Act in § 1 (b) declares that it is federal policy "to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water pollution." But the Act makes clear that it is federal, not state, law that in the end controls the pollution of interstate or navigable waters.[3] While the States are given time to establish water quality standards, § 10 (c)(1), if a State fails to do so the federal administrator[4] promulgates one. § 10 (c)(2). Section 10 (a) makes pollution of interstate or navigable waters subject "to abatement" when it "endangers the health or welfare of any persons."

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[3] The contrary indication in *Ohio* v. *Wyandotte Chemicals Corp.*, 401 U. S. 493, 498 n. 3, was based on the preoccupation of that litigation with public nuisance under Ohio law, not the federal common law which we now hold is ample basis for federal jurisdiction under 28 U. S. C. § 1331 (a).

[4] The powers granted the Secretary of the Interior under the Federal Water Quality Act of 1965, 79 Stat. 903, were assigned by the President to the Administrator of the Environmental Protection Agency pursuant to Reorganization Plan No. 3 of 1970. See 35 Fed. Reg. 15623.

The abatement that is authorized follows a long-drawn-out procedure unnecessary to relate here. It uses the conference procedure, hoping for amicable settlements. But if none is reached, the federal administrator may request the Attorney General to bring suit on behalf of the United States for abatement of the pollution. § 10 (g).

The remedy sought by Illinois is not within the precise scope of remedies prescribed by Congress. Yet the remedies which Congress provides are not necessarily the only federal remedies available. "It is not uncommon for federal courts to fashion federal law where federal rights are concerned." *Textile Workers* v. *Lincoln Mills*, 353 U. S. 448, 457. When we deal with air and water in their ambient or interstate aspects, there is a federal common law,[5] as *Texas* v. *Pankey*, 441 F. 2d 236, recently held.

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[5] While the various federal environmental protection statutes will not necessarily mark the outer bounds of the federal common law, they may provide useful guidelines in fashioning such rules of decision. What we said in another connection in *Textile Workers* v. *Lincoln Mills*, 353 U. S. 448, 456–457, is relevent here:

"The question then is, what is the substantive law to be applied in suits under § 301 (a)? We conclude that the substantive law to apply in suits under § 301 (a) is federal law, which the courts must fashion from the policy of our national labor laws. The Labor Management Relations Act expressly furnishes some substantive law. It points out what the parties may or may not do in certain situations. Other problems will lie in the penumbra of express statutory mandates. Some will lack express statutory sanction but will be solved by looking at the policy of the legislation and fashioning a remedy that will effectuate that policy. The range of judicial inventiveness will be determined by the nature of the problem. Federal interpretation of the federal law will govern, not state law. But state law, if compatible with the purpose of § 301, may be resorted to in order to find the rule that will best effectuate the federal policy. Any state law applied, however, will be absorbed as federal law and will not be an independent source of private rights." (Citations omitted.) See also Woods & Reed, The Supreme Court and Interstate Environmental Quality: Some Notes on the *Wyandotte* Case, 12 Ariz. L. Rev. 691, 713–714; Note, 56 Va. L. Rev. 458.

The application of federal common law to abate a public nuisance in interstate or navigable waters is not inconsistent with the Water Pollution Control Act. Congress provided in § 10 (b) of that Act that, save as a court may decree otherwise in an enforcement action, "[s]tate and interstate action to abate pollution of interstate or navigable waters shall be encouraged and shall not . . . be displaced by Federal enforcement action."

The leading air case is *Georgia* v. *Tennessee Copper Co.*, 206 U. S. 230, where Georgia filed an original suit in this Court against a Tennessee company whose noxious gases were causing a wholesale destruction of forests, orchards, and crops in Georgia. The Court said:

> "The caution with which demands of this sort, on the part of a State, for relief from injuries analogous to torts, must be examined, is dwelt upon in *Missouri* v. *Illinois*, 200 U. S. 496, 520, 521. But it is plain that some such demands must be recognized, if the grounds alleged are proved. When the States by their union made the forcible abatement of outside nuisances impossible to each, they did not thereby agree to submit to whatever might be done. They did not renounce the possibility of making reasonable demands on the ground of their still remaining *quasi*-sovereign interests; and the alternative to force is a suit in this court. *Missouri* v. *Illinois*, 180 U. S. 208, 241." 206 U. S., at 237.

The nature of the nuisance was described as follows:

> "It is a fair and reasonable demand on the part of a sovereign that the air over its territory should not be polluted on a great scale by sulphurous acid gas, that the forests on its mountains, be they better or worse, and whatever domestic destruction they have suffered, should not be further destroyed or threatened by the act of persons beyond its control, that

> the crops and orchards on its hills should not be endangered from the same source. If any such demand is to be enforced this must be, notwithstanding the hesitation that we might feel if the suit were between private parties, and the doubt whether for the injuries which they might be suffering to their property they should not be left to an action at law." *Id.*, at 238.

Our decisions concerning interstate waters contain the same theme. Rights in interstate streams, like questions of boundaries, "have been recognized as presenting federal questions." [6] *Hinderlider* v. *La Plata Co.*, 304 U. S. 92, 110. The question of apportionment of interstate waters is a question of "federal common law" upon which state statutes or decisions are not conclusive.[7] *Ibid.*

In speaking of the problem of apportioning the waters of an interstate stream, the Court said in *Kansas* v. *Colorado*, 206 U. S. 46, 98, that "through these successive disputes and decisions this court is practically building up what may not improperly be called interstate com-

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[6] Thus, it is not only the character of the parties that requires us to apply federal law. See *Georgia* v. *Tennessee Copper Co.*, 206 U. S. 230, 237; cf. *Wisconsin* v. *Pelican Ins. Co.*, 127 U. S. 265, 289; The Federalist No. 80 (A. Hamilton). As Mr. Justice Harlan indicated for the Court in *Banco Nacional de Cuba* v. *Sabbatino*, 376 U. S. 398, 421–427, where there is an overriding federal interest in the need for a uniform rule of decision or where the controversy touches basic interests of federalism, we have fashioned federal common law. See also *Clearfield Trust Co.* v. *United States*, 318 U. S. 363; *D'Oench, Duhme & Co.* v. *Federal Deposit Ins. Corp.*, 315 U. S. 447; C. Wright, The Law of Federal Courts 249 (2d ed. 1970); Woods & Reed, *supra*, n. 5, at 703–713; Note, 50 Texas L. Rev. 183. Certainly these same demands for applying federal law are present in the pollution of a body of water such as Lake Michigan bounded, as it is, by four States.

[7] Those who maintain that state law governs overlook the fact that the *Hinderlider* case was written by Mr. Justice Brandeis who also wrote for the Court in *Erie R. Co.* v. *Tompkins*, 304 U. S. 64, the two cases being decided the same day.

mon law." And see *Texas* v. *New Jersey*, 379 U. S. 674 (escheat of intangible personal property), *Texas* v. *Florida*, 306 U. S. 398, 405 (suit by bill in the nature of interpleader to determine the true domicile of a decedent as the basis of death taxes).

Equitable apportionment of the waters of an interstate stream has often been made under the head of our original jurisdiction. *Nebraska* v. *Wyoming*, 325 U. S. 589; *Kansas* v. *Colorado*, *supra*; cf. *Arizona* v. *California*, 373 U. S. 546, 562. The applicable federal common law depends on the facts peculiar to the particular case.

> "Priority of appropriation is the guiding principle. But physical and climatic conditions, the consumptive use of water in the several sections of the river, the character and rate of return flows, the extent of established uses, the availability of storage water, the practical effect of wasteful uses on downstream areas, the damage to upstream areas as compared to the benefits to downstream areas if a limitation is imposed on the former—these are all relevant factors. They are merely an illustrative, not an exhaustive catalogue. They indicate the nature of the problem of apportionment and the delicate adjustment of interests which must be made." 325 U. S., at 618.

When it comes to water pollution this Court has spoken in terms of "a public nuisance," [8] *New York* v. *New Jer-*

[8] In *North Dakota* v. *Minnesota*, 263 U. S. 365, 374, the Court said:

"[W]here one State, by a change in its method of draining water from lands within its border, increases the flow into an interstate stream, so that its natural capacity is greatly exceeded and the water is thrown upon the farms of another State, the latter State has such an interest as quasi-sovereign in the comfort, health and prosperity of its farm owners that resort may be had to this Court for relief. It is the creation of a public nuisance of simple type for which a State may properly ask an injunction."

sey, 256 U. S., at 313; *New Jersey* v. *New York City*, 283 U. S. 473, 481, 482. In *Missouri* v. *Illinois*, 200 U. S. 496, 520–521, the Court said, "It may be imagined that a nuisance might be created by a State upon a navigable river like the Danube, which would amount to a *casus belli* for a State lower down, unless removed. If such a nuisance were created by a State upon the Mississippi the controversy would be resolved by the more peaceful means of a suit in this court."

It may happen that new federal laws and new federal regulations may in time pre-empt the field of federal common law of nuisance. But until that comes to pass, federal courts will be empowered to appraise the equities of the suits alleging creation of a public nuisance by water pollution. While federal law governs,[9] consideration of state standards may be relevant. Cf. *Connecticut* v. *Massachusetts*, 282 U. S. 660, 670; *Kansas* v. *Colorado*, 185 U. S. 125, 146–147. Thus, a State with high water-quality standards may well ask that its strict standards be honored and that it not be compelled to lower itself to the more degrading standards of a neighbor. There are no fixed rules that govern; these

[9] "Federal common law and not the varying common law of the individual States is, we think, entitled and necessary to be recognized as a basis for dealing in uniform standard with the environmental rights of a State against improper impairment by sources outside its domain. The more would this seem to be imperative in the present era of growing concern on the part of a State about its ecological conditions and impairments of them. In the outside sources of such impairment, more conflicting disputes, increasing assertions and proliferating contentions would seem to be inevitable. Until the field has been made the subject of comprehensive legislation or authorized administrative standards, only a federal common law basis can provide an adequate means for dealing with such claims as alleged federal rights. And the logic and practicality of regarding such claims as being entitled to be asserted within the federal-question jurisdiction of § 1331 (a) would seem to be self-evident." *Texas* v. *Pankey*, 441 F. 2d 236, 241–242.

will be equity suits in which the informed judgment of the chancellor will largely govern.

We deny, without prejudice, the motion for leave to file. While this original suit normally might be the appropriate vehicle for resolving this controversy, we exercise our discretion to remit the parties to an appropriate district court [10] whose powers are adequate to resolve the issues.

So ordered.

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[10] The rule of decision being federal, the "action . . . may be brought only in the judicial district where all defendants reside, or in which the claim arose," 28 U. S. C. § 1391 (b), thereby giving flexibility to the choice of venue. See also 28 U. S. C. § 1407.

Whatever may be a municipality's sovereign immunity in actions for damages, see Van Alstyne, Governmental Tort Liability: A Decade of Change, 1966 U. Ill. L. F. 919, 944–948; Note, 4 Suffolk L. Rev. 832 (1970), actions seeking injunctive relief stand on a different footing. The cases are virtually unanimous in holding that municipalities are subject to injunctions to abate nuisances. See cases collected in 17 E. McQuillin, The Law of Municipal Corporations § 49.51 *et seq.* (3d rev. ed. 1968). See also Wis. Stat. Ann. § 59.96 (6)(b) (1957) as respects the suability of metropolitan sewerage commissions.

While the kind of equitable relief to be accorded lies in the discretion of the chancellor (*Harrisonville* v. *Dickey Clay Mfg. Co.*, 289 U. S. 334), a State that causes a public nuisance is suable in this Court and any of its public entities is suable in a federal district court having jurisdiction:

"[I]t is generally held that a municipality, like a private individual, may be enjoined from maintaining a nuisance. Thus in a proper case a municipal corporation will be restrained by injunction from creating a nuisance on private property, as by the discharge of sewage or poisonous gases thereon, or, in some jurisdictions, by the obstruction of drainage of waters, or by discharging sewage or filth into a stream and polluting the water to the damage of lower riparian owners, or by dumping garbage or refuse, or by other acts. Likewise, a municipality may be enjoined from creating or operating a nuisance, whether the municipality is acting in a governmental or proprietary capacity, impairing property rights. And, if a nuisance is established causing irreparable injury for which there is no adequate remedy at law it may be enjoined irrespective of the resulting damage or injury to the municipality." 17 McQuillin, *supra*, § 49.55.

The pertinent provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§1251 *et seq.*, are as follows:

SUBCHAPTER I — RESEARCH AND RELATED PROGRAMS

§1251. [101*] Congressional declaration of goals and policy

(a) The objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter —

(1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;

(2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

(3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

(4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;

(5) it is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State; and

* Section numbers from the Act itself are bracketed alongside section numbers from 33 U.S.C.

(6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans.

* * *

§1252. [102] Comprehensive programs for water pollution control

Preparation and development

(a) The Administrator shall, after careful investigation, and in cooperation with other Federal agencies, State water pollution control agencies, interstate agencies, and the municipalities and industries involved, prepare or develop comprehensive programs for preventing, reducing, or eliminating the pollution of the navigable waters and ground waters and improving the sanitary condition of surface and underground waters. In the development of such comprehensive programs due regard shall be given to the improvements which are necessary to conserve such waters for the protection and propagation of fish and aquatic life and wildlife, recreational purposes, and the withdrawal of such waters for public water supply, agricultural, industrial, and other purposes. For the purpose of this section, the Administrator is authorized to make joint investigations with any such agencies of the condition of any waters in any State or States, and of the discharges of any sewage, industrial wastes, or substance which may adversely affect such waters.

* * *

§1254. [104] Research, investigations, training, and information

Establishment of national programs; cooperation; investigations; water quality surveillance system; reports

(a) The Administrator shall establish national programs for the prevention, reduction, and elimination of pollution. . . .

Research and studies on harmful effects of pollutants; cooperation with Secretary of Health, Education, and Welfare

(c) In carrying out the provisions of subsection (a) of this section the Administrator shall conduct research on, and survey the results of scientific studies on, the harmful effects on the health or welfare of persons caused by pollutants.

* * *

Lake pollution

(h) The Administrator is authorized to enter into contracts with, or make grants to, public or private agencies and organizations and individuals for (A) the purpose of developing and demonstrating new or improved methods for the prevention, removal, reduction, and elimination of pollution in lakes, including the undesirable effects of nutrients and vegetation, and (B) the construction of publicly owned research facilities for such purpose.

* * *

§1255. [105] Grants for research and development

Demonstration projects covering storm waters, advanced waste treatment and water purification methods, and joint treatment systems for municipal and industrial wastes

(a) The Administrator is authorized to conduct in the Environmental Protection Agency, and to make grants to any State, municipality, or intermunicipal or interstate agency for the purpose of assisting in the development of —

(1) any project which will demonstrate a new or improved method of preventing, reducing, and eliminating the discharge into any waters of pollutants from sewers

which carry storm water or both storm water and pollutants; or

(2) any project which will demonstrate advanced waste treatment and water purification methods (including the temporary use of new or improved chemical additives which provide substantial immediate improvement to existing treatment processes), or new or improved methods of joint treatment systems for municipal and industrial wastes;

and to include in such grants such amounts as are necessary for the purpose of reports, plans, and specifications in connection therewith.

* * *

Accelerated and priority development of waste management and waste treatment methods and identification and measurement methods

(d) In carrying out the provisions of this section, the Administrator shall conduct, on a priority basis, an accelerated effort to develop, refine, and achieve practical application of:

(1) waste management methods applicable to point and nonpoint sources of pollutants to eliminate the discharge of pollutants, including, but not limited to, elimination of runoff of pollutants and the effects of pollutants from inplace or accumulated sources;

(2) advanced waste treatment methods applicable to point and nonpoint sources, including inplace or accumulated sources of pollutants, and methods for reclaiming and recycling water and confining pollutants so they will not migrate to cause water or other environmental pollution; and

(3) improved methods and procedures to identify and measure the effects of pollutants on the chemical,

physical, and biological integrity of water, including those pollutants created by new technological developments.

* * *

§1258. [108] Pollution control in Great Lakes

Demonstration projects

(a) The Administrator, in cooperation with other Federal departments, agencies, and instrumentalities is authorized to enter into agreements with any State, political subdivision, interstate agency, or other public agency, or combination thereof, to carry out one or more projects to demonstrate new methods and techniques and to develop preliminary plans for the elimination or control of pollution, within all or any part of the watersheds of the Great Lakes. Such projects shall demonstrate the engineering and economic feasibility and practicality of removal of pollutants and prevention of any polluting matter from entering into the Great Lakes in the future and other reduction and remedial techniques which will contribute substantially to effective and practical methods of pollution prevention, reduction, or elimination.

* * *

SUBCHAPTER II — GRANTS FOR CONSTRUCTION OF TREATMENT WORKS

§1281. [201] Congressional declaration of purpose

(a) It is the purpose of this subchapter to require and to assist the development and implementation of waste treatment management plans and practices which will achieve the goals of this chapter.

(b) Waste treatment management plans and practices shall provide for the application of the best practicable waste treatment technology before any discharge into receiving waters, including reclaiming and recycling of water, and con-

fined disposal of pollutants so they will not migrate to cause water or other environmental pollution and shall provide for consideration of advanced waste treatment techniques.

(c) To the extent practicable, waste treatment management shall be on an areawide basis and provide control or treatment of all point and nonpoint sources of pollution, including in place or accumulated pollution sources.

(d) The Administrator shall encourage waste treatment management which results in the construction of revenue producing facilities providing for —

(1) the recycling of potential sewage pollutants through the production of agriculture, silviculture, or aquaculture products, or any combination thereof;

(2) the confined and contained disposal of pollutants not recycled;

(3) the reclamation of wastewater; and

(4) the ultimate disposal of sludge in a manner that will not result in environmental hazards.

(e) The Administrator shall encourage waste treatment management which results in integrating facilities for sewage treatment and recycling with facilities to treat, dispose of, or utilize other industrial and municipal wastes, including but not limited to solid waste and waste heat and thermal discharges. Such integrated facilities shall be designed and operated to produce revenues in excess of capital and operation and maintenance costs and such revenues shall be used by the designated regional management agency to aid in financing other environmental improvement programs.

(f) The Administrator shall encourage waste treatment management which combines "open space" and recreational considerations with such management.

(g)(1) The Administrator is authorized to make grants to any State, municipality, or intermunicipal or interstate agency for the construction of publicly owned treatment works.

(2) The Administrator shall not make grants from funds authorized for any fiscal year beginning after June 30, 1974, to any State, municipality, or intermunicipal or interstate agency for the erection, building, acquisition, alteration, remodeling, improvement, or extension of treatment works unless the grant applicant has satisfactorily demonstrated to the Administrator that —

(A) alternative waste management techniques have been studied and evaluated and the works proposed for grant assistance will provide for the application of the best practicable waste treatment technology over the life of the works consistent with the purposes of this subchapter; and

(B) as appropriate, the works proposed for grant assistance will take into account and allow to the extent practicable the application of technology at a later date which will provide for the reclaiming or recycling of water or otherwise eliminate the discharge of pollutants.

(3) The Administrator shall not approve any grant after July 1, 1973, for treatment works under this section unless the applicant shows to the satisfaction of the Administrator that each sewer collection system discharging into such treatment works is not subject to excessive infiltration.

* * *

(5) The Administrator shall not make grants from funds authorized for any fiscal year beginning after September 30, 1978, to any State, municipality, or intermunicipal or interstate agency for the erection, building, acquisition, alteration, remodeling, improvement, or extension of treatment works unless the grant applicant has satisfactorily demonstrated to the Administrator that innovative and alternative wastewater treatment processes and techniques which provide for the reclaiming

and reuse of water, otherwise eliminate the discharge of pollutants, and utilize recycling techniques, land treatment, new or improved methods of waste treatment management for municipal and industrial waste (discharged into municipal systems) and the confined disposal of pollutants, so that pollutants will not migrate to cause water or other environmental pollution, have been fully studied and evaluated by the applicant taking into account subsection (d) of this section and taking into account and allowing to the extent practicable the more efficient use of energy and resources.

(6) The Administrator shall not make grants from funds authorized for any fiscal year beginning after September 30, 1978, to any State, municipality, or intermunicipal or interstate agency for the erection, building, acquisition, alteration, remodeling, improvement, or extension of treatment works unless the grant applicant has satisfactorily demonstrated to the Administrator that the applicant has analyzed the potential recreation and open space opportunities in the planning of the proposed treatment works.

* * *

(i) The Administrator shall encourage waste treatment management methods, processes, and techniques which will reduce total energy requirements.

(j) The Administrator is authorized to make a grant for any treatment works utilizing processes and techniques meeting the guidelines promulgated under section 1314(d)(3) of this title, if the Administrator determines it is in the public interest and if in the cost effectiveness study made of the construction grant application for the purpose of evaluating alternative treatment works, the life cycle cost of the treatment works for which the grant is to be made does not exceed the life cycle cost of the most cost effective alternative by more than 15 per centum.

* * *

§1297. [217] Guidelines for cost-effectiveness analysis

Any guidelines for cost-effectiveness analysis published by the Administrator under this subchapter shall provide for the identification and selection of cost effective alternatives to comply with the objective and goals of this chapter and sections 1281(b), 1281(d), 1281(g)(2)(A), and 1311(b)(2)(B) of this title.

§1311. [301] Effluent limitations

Illegality of pollutant discharges except in compliance with law

(a) Except as in compliance with this [Act], section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.

Timeable for achievement of objectives

(b) In order to carry out the objective of this chapter there shall be achieved —

* * *

(B) for publicly owned treatment works in existence on July 1, 1977, or approved pursuant to section 1283 of this title prior to June 30, 1974 (for which construction must be completed within four years of approval), effluent limitations based upon secondary treatment as defined by the Administrator pursuant to section 1314(d)(1) of this title; or,

(C) not later than July 1, 1977, any more stringent limitation, including those necessary to meet water quality standards, treatment standards, or schedules of compliance, established pursuant to any State law or regulations (under authority preserved by section 1370 of this title) or any other Federal law or regulation, or required to implement any applicable water quality standard established pursuant to this chapter.

* * *

(B) not later than July 1, 1983, compliance by all publicly owned treatment works with the requirements set forth in section 1281(g)(2)(A) of this title;

* * *

§1312. [302] Water quality related effluent limitations

Establishment

(a) Whenever, in the judgment of the Administrator, discharges of pollutants from a point source or group of point sources, with the application of effluent limitations required under section 1311(b)(2) of this title, would interfere with the attainment or maintenance of that water quality in a specific portion of the navigable waters which shall assure protection of public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water, effluent limitations (including alternative effluent control strategies) for such point source or sources shall be established which can reasonably be expected to contribute to the attainment or maintenance of such water quality.

Notice; hearing; adjustment of limitation by Administrator

(b)(1) Prior to establishment of any effluent limitation pursuant to subsection (a) of this section, the Administrator shall issue notice of intent to establish such limitation and within ninety days of such notice hold a public hearing to determine the relationship of the economic and social costs of achieving any such limitation or limitations, including any economic or social dislocation in the affected community or communities, to the social and economic benefits to be obtained (including the attainment of the objective of this chapter) and to determine whether or not such effluent limitations can be implemented with available technology or other alternative control strategies.

(2) If a person affected by such limitation demonstrates at such hearing that (whether or not such technology or other

alternative control strategies are available) there is no reasonable relationship between the economic and social costs and the benefits to be obtained (including attainment of the objective of this chapter), such limitation shall not become effective and the Administrator shall adjust such limitation as it applies to such person.

* * *

§1314. [304] Information and guidelines

Criteria development and publication

(a)(1) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) criteria for water quality accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, including ground water; (B) on the concentration and dispersal of pollutants, or their byproducts, through biological, physical, and chemical processes; and (C) on the effects of pollutants on biological community diversity, productivity, and stability, including information on the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters.

(2) The Administrator, after consultation with appropriate Federal and State agencies and other interested persons, shall develop and publish, within one year after October 18, 1972 (and from time to time thereafter revise) information (A) on the factors necessary to restore and maintain the chemical, physical, and biological integrity of all navigable waters, ground waters, waters of the contiguous zone, and the oceans; (B) on the factors necessary for the protection and propagation of shellfish, fish, and wildlife for classes and

categories of receiving waters and to allow recreational activities in and on the water; and (C) on the measurement and classification of water quality. . . .

* * *

(4) The Administrator shall, within 90 days after December 27, 1977, and from time to time thereafter, publish and revise as appropriate information identifying conventional pollutants, including but not limited to, pollutants classified as biological oxygen demanding, suspended solids, fecal coliform, and pH. The thermal component of any discharge shall not be identified as a conventional pollutant under this paragraph.

(5)(A) The Administrator, to the extent practicable before consideration of any request under section 1311(g) of this title and within six months after December 27, 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and to allow recreational activities in and on the water.

(B) The Administrator, to the extent practicable before consideration of any application under section 1311(h) of this title and within six months after December 27, 1977, shall develop and publish information on the factors necessary for the protection of public water supplies, and the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife, and to allow recreational activities, in and on the water.

* * *

Effluent limitation guidelines

(b) For the purpose of adopting or revising effluent limitations under this chapter the Administrator shall, after consultation with appropriate Federal and State agencies and other interested persons, published within one year of October

18, 1972, regulations, providing guidelines for effluent limitations, and, at least annually thereafter, revise, if appropriate, such regulations. . . .

* * *

§1317. [307] Toxic and pretreatment effluent standards

Toxic pollutant list; revision; hearing; promulgation of standards; effective date; consultation

(a)(1) On and after December 27, 1977, the list of toxic pollutants or combination of pollutants subject to this chapter shall consist of those toxic pollutants listed in table 1 of Committee Print Numbered 95-30 of the Committee on Public Works and Transportation of the House of Representatives, and the Administrator shall publish, not later than the thirtieth day after December 27, 1977, that list. From time to time thereafter, the Administrator may revise such list and the Administrator is authorized to add to or remove from such list any pollutant. The Administrator in publishing any revised list, including the addition or removal of any pollutant from such list, shall take into account toxicity of the pollutant, its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms, and the nature and extent of the effect of the toxic pollutant on such organisms. A determination of the Administrator under this paragraph shall be final except that if, on judicial review, such determination was based on arbitrary and capricious action of the Administrator, the Administrator shall make a redetermination.

(2) Each toxic pollutant listed in accordance with paragraph (1) of this subsection shall be subject to effluent limitations resulting from the application of the best available technology economically achievable for the applicable category or class of point sources established in accordance with sections 1311(b)(2)(A) and 1314(b)(2) of this title. . . .

* * *

(4) Any effluent standard promulgated under this section shall be at that level which the Administrator determines provides an ample margin of safety.

* * *

§1319. [309] Enforcement

State enforcement; compliance orders

(a)(1) Whenever, on the basis of any information available to him, the Administrator finds that any person is in violation of any condition or limitation which implements section 1311, 1312, 1316, 1317, 1318, 1328, or 1345 of this title in a permit issued by a State under an approved permit program under section 1342 or 1344 of this title, he shall proceed under his authority in paragraph (3) of this subsection or he shall notify the person in alleged violation and such State of such finding. If beyond the thirtieth day after the Administrator's notification the State has not commenced appropriate enforcement action, the Administrator shall issue an order requiring such person to comply with such condition or limitation or shall bring a civil action in accordance with subsection (b) of this section.

(2) Whenever, on the basis of information available to him, the Administrator finds that violations of permit conditions or limitations as set forth in paragraph (1) of this subsection are so widespread that such violations appear to result from a failure of the State to enforce such permit conditions or limitations effectively, he shall so notify the State. If the Administrator finds such failure extends beyond the thirtieth day after such notice, he shall give public notice of such finding. During the period beginning with such public notice and ending when such State satisfies the Administrator that it will enforce such conditions and limitations (hereafter referred to in this section as the period of "federally assumed enforcement"), except where an extension has been granted under paragraph (5)(B) of this subsection, the Administrator shall enforce any permit condition or limitation with respect to any person —

(A) by issuing an order to comply with such condition or limitation, or

(B) by bringing a civil action under subsection (b) of this section.

(3) Whenever on the basis of any information available to him the Administrator finds that any person is in violation of section 1311, 1312, 1316, 1317, 1318, 1328, or 1345 of this title, or is in violation of any permit condition or limitation implementing any of such sections in a permit issued under section 1342 of this title by him or by a State or in a permit issued under section 1344 of this title by a State, he shall issue an order requiring such person to comply with such section or requirement, or he shall bring a civil action in accordance with subsection (b) of this section.

* * *

Civil actions

(b) The Administrator is authorized to commence a civil action for appropriate relief, including a permanent or temporary injunction, for any violation for which he is authorized to issue a compliance order under subsection (a) of this section. Any action under this subsection may be brought in the district court of the United States for the district in which the defendant is located or resides or is doing business, and such court shall have jurisdiction to restrain such violation and to require compliance. Notice of the commencement of such action shall be given immediately to the appropriate State.

Criminal penalties

(c)(1) Any person who willfully or negligently violates section 1311, 1312, 1316, 1317, or 1318 of this title, or any permit condition or limitation implementing any of such sections in a permit issued under section 1342 of this title by the Administrator or by a State or in a permit issued under section 1344 of this title by a State, shall be punished by a fine of not less

than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than one year, or by both. If the conviction is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than $50,000 per day of violation, or by imprisonment for not more than two years, or both.

* * *

Civil penalties

(d) Any person who violates section 1311, 1312, 1316, 1317, 1318, 1328, or 1345 of this title, or any permit condition or limitation implementing any of such sections in a permit issued under section 1342 of this title by the Administrator, or by a State, or in a permit issued under section 1344 of this title by a State, and any person who violates any order issued by the Administrator under subsection (a) of this section, shall be subject to a civil penalty not to exceed $10,000 per day of such violation.

* * *

§1325. [315] National Study Commission

Establishment

(a) There is established a National Study Commission, which shall make a full and complete investigation and study of all of the technological aspects of achieving, and all aspects of the total economic, social, and environmental effects of achieving or not achieving, the effluent limitations and goals set forth for 1983 in section 1311(b)(2) of this title.

* * *

SUBCHAPTER IV — PERMITS AND LICENSES

§1341. [401] Certification

Compliance with applicable requirements; application; procedures; license suspension

(a)(1) Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of this title. . . .

(2) Upon receipt of such application and certification the licensing or permitting agency shall immediately notify the Administrator of such application and certification. Whenever such a discharge may affect, as determined by the Administrator, the quality of the waters of any other State, the Administrator within thirty days of the date of notice of application for such Federal license or permit shall so notify such other State, the licensing or permitting agency, and the applicant. If, within sixty days after receipt of such notification, such other State determines that such discharge will affect the quality of its waters so as to violate any water quality requirement in such State, and within such sixty-day period notifies the Administrator and the licensing or permitting agency in writing of its objection to the issuance of such license or permit and requests a public hearing on such objection, the licensing or permitting agency shall hold such a hearing. The Administrator shall at such hearing submit his evaluation and recommendations with respect to any such objection to the licensing or permitting agency. Such agency, based upon the recommendations of such State, the Administrator, and upon any additional evidence, if any, presented to the agency at the hearing, shall

condition such license or permit in such manner as may be necessary to insure compliance with applicable water quality requirements. If the imposition of conditions cannot insure such compliance such agency shall not issue such license or permit.

* * *

§1342. [402] National pollutant discharge elimination system

Permits for discharge of pollutants

(a)(1) Except as provided in sections 1328 and 1344 of this title, the Administrator may, after opportunity for public hearing, issue a permit for the discharge of any pollutant, or combination of pollutants . . . upon condition that such discharge will meet either all applicable requirements under sections 1311, 1312, 1316, 1317, 1318, and 1343 of this title, or prior to the taking of necessary implementing actions relating to all such requirements, such conditions as the Administrator determines are necessary to carry out the provisions of this chapter.

(2) The Administrator shall prescribe conditions for such permits to assure compliance with the requirements of paragraph (1) of this subsection. . .

(3) The permit program of the Administrator under paragraph (1) of this subsection, and permits issued thereunder, shall be subject to the same terms, conditions, and requirements as apply to a State permit program and permits issued thereunder under subsection (b) of this section.

* * *

State permit programs

(b) At any time after the promulgation of the guidelines required by subsection (h)(2) of section 1314 of this title, the Governor of each State desiring to administer its own permit program for discharges into navigable waters within its jurisdiction may submit to the Administrator a full and complete

description of the program it proposes to establish and administer under State law or under an interstate compact. . . . The Administrator shall approve each such submitted program unless he determines that adequate authority does not exist:

* * *

(3) To insure that the public, and any other State the waters of which may be affected, receive notice of each application for a permit and to provide an opportunity for public hearing before a ruling on each such application;

* * *

(5) To insure that any State (other than the permitting State), whose waters may be affected by the issuance of a permit may submit written recommendations to the permitting State (and the Administrator) with respect to any permit application and, if any part of such written recommendations are not accepted by the permitting State, that the permitting State will notify such affected State (and the Administrator) in writing of its failure to so accept such recommendations together with its reasons for so doing;

* * *

Compliance with permits

(k) Compliance with a permit issued pursuant to this section shall be deemed compliance, for purposes of sections 1319 and 1365 of this title, with sections 1311, 1312, 1316, 1317, and 1343 of this title, except any standard imposed under section 1317 of this title for a toxic pollutant injurious to human health. . . .

* * *

§1364. [504] Emergencies

Emergency powers

(a) Notwithstanding any other provision of this chapter, the Administrator upon receipt of evidence that a pollution source or combination of sources is presenting an imminent and substantial endangerment to the health of persons or to the welfare of persons where such endangerment is to the livelihood of such persons, such as inability to market shellfish, may bring suit on behalf of the United States in the appropriate district court to immediately restrain any person causing or contributing to the alleged pollution to stop the discharge of pollutants causing or contributing to such pollution or to take such other action as may be necessary.

* * *

§1365. [505] Citizen suits

Authorization; jurisdiction

(a) Except as provided in subsection (b) of this section, any citizen may commence a civil action on his own behalf —

(1) against any person . . . who is alleged to be in violation of (A) an effluent standard or limitation under this chapter or (B) an order issued by the Administrator or a State with respect to such a standard or limitation, or

(2) against the Administrator where there is alleged a failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator.

* * *

Statutory or common law rights not restricted

(e) Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or

common law to seek enforcement of any effluent standard or limitation or to seek any other relief (including relief against the Administrator or a State agency).

* * *

§1369. [509] Administrative procedure and judicial review

* * *

Review of Administrator's actions

(b)(1) Review of the Administrator's action (A) in promulgating any standard of performance under section 1316 of this title, (B) in making any determination pursuant to section 1316(b)(1)(C) of this title, (C) in promulgating any effluent standard, prohibition, or pretreatment standard under section 1317 of this title, (D) in making any determination as to a State permit program submitted under section 1342(b) of this title, (E) in approving or promulgating any effluent limitation or other limitation under section 1311, 1312, or 1316 of this title, and (F) in issuing or denying any permit under section 1342 of this title, may be had by any interested person in the Circuit Court of Appeals of the United States for the Federal judicial district in which such person resides or transacts such business upon application by such person. Any such application shall be made within ninety days from the date of such determination, approval, promulgation, issuance or denial, or after such date only if such application is based solely on grounds which arose after such ninetieth day.

(2) Action of the Administrator with respect to which review could have been obtained under paragraph (1) of this subsection shall not be subject to judicial review in any civil or criminal proceeding for enforcement.

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